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TRANSACTIONS

OF THE

National Dental Association

AT THE

FIFTH ANNUAL SESSION

HELD AT

MILWAUKEE, WIS.

Commencing August 6, 1901.

DENTAL DIGEST.
J. N. CROUSE, D.D.S., PUBLISHER.
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The National Dental Association, although formally accepting and publishing the reports of the various Sections, and the Essays read before the Association, holds itself wholly irresponsible for the opinions, theories, or criticisms therein contained, except when otherwise decided by special resolution.—*Constitution.*

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PRESENTED TO THE COLLEGE OF
DENTAL AND ORAL SURGERY OF
NEW YORK BY THE DEAN
WILLIAM CARR, M.D. D.D.S.

ANNUAL ADDRESS.

By G. V. BLACK, President.

The constitution of this body makes it obligatory upon its president to present an address at the opening of the annual session, leaving it to him to select such subject as he may suppose will be of interest to its members. For this occasion I have chosen to speak of the National Dental Association, of its form of work and particularly of its constitution, which it seems to me now needs a thorough revision and much amendment to adapt it to the great and steady growth of the organization.

The preliminary meeting for the organization of a national dental association that should be a delegate body representing the organized dental profession in America convened first at Niagara Falls on August 3, 1859. At that time there were only eight dental societies and two dental colleges, represented by twenty-six delegates. A complete organization was not effected until the next year, when the delegates of the various local dental associations and colleges met according to adjournment in the Smithsonian Institute at Washington on July 31, 1860 At this meeting there were ten dental societies and one dental college, represented by twenty-three delegates. Only twenty-one of these, representing ten associations, seem to have signed the original constitution, and the name was changed to "American Dental Association."

This constitution was a very long document for so small an organization, but the result fully justified its length and the by-laws adopted. Individuals had been appointed at the preliminary meeting to present essays and papers, and they went at the literary and scientific work with a zeal and an industry that promised much for the future. The results have fully borne out the promise of this

beginning, for although the young organization was beset with extraordinary difficulties, owing to the breaking out of the Civil War during the next year, 1861, which prevented a meeting, the delegates were found together again on July 30, 1862, at Cleveland; and went at their work with the vigorous sternness so suggestive of the troubled times. From that time on no meeting has failed to be held because of lack of interest on the part of the profession. The representation grew from tens to hundreds. The societies became so numerous that to some it seemed necessary to exclude all delegates except those from state or territorial organizations. This was not so much on account of numbers as because in many of the states there were numerous dental societies and many individuals belonged to several of them, so certain regions came to be represented in duplicate. At present, however, all local organizations are admitted to representation.

The work done by this body for the benefit of the dental profession, and through it for the benefit of the people of our commonwealth, has been great and of the most substantial character. The amount of stimulation it has given to thought and to research work for the fuller development of truth cannot be fully told; yet this is perhaps small when compared with the ambition it has given to individual men to become better practitioners and the spread of this impulse to the general membership of the profession. It is not so much that we have wiser men in dentistry now than fifty years ago as it is that we have many more wise men.

As an indication of the growth of this association I give some figures which will represent it and show the direction it is taking. The manner of organization provided for three classes of membership—First, delegate members from dental societies or other organizations of dentists; Second, permanent members, those who have represented a dental organization and who signify their desire to become permanent members; Third, honorary members, citizens of foreign countries who may be elected to membership. Under such arrangement the association elected none but its honorary members, and at its first meeting and for some years afterwards its membership was principally composed of delegates; but now the number of permanent members has exceeded that of delegates. In 1860 there were ten organizations represented by twenty-one delegates. In 1868, eighty permanent members and forty-eight

organizations represented by delegates. In 1877, eighty-eight permanent members and twenty-three organizations represented by delegates. In 1888, one hundred and eighty permanent members and twenty-three organizations represented by delegates. In 1895, two hundred and fifty-five permanent members and fifty-three organizations represented by delegates. Then the union of the American and the Southern Dental Associations was effected, and the name was changed to "National Dental Association," and later all except state organizations were denied representation, with the result that in 1899 there were three hundred and sixty-nine permanent members and only twenty organizations represented by delegates. From this it would seem that the organization is rapidly losing its representative character and lapsing into a fixed organization controlled by its permanent membership exclusively. In comparing the list of members with the organizations represented, I find we have members from states that have no official representation, and this body has no official knowledge that there is now any society organization in those states.

I have been making a broad study of the organization and workings of this association, and it seems to me that some evils have crept in which need eradication, of which this is perhaps one of the least. On this point of representation it seems to me necessary that some changes be made which will assist in maintaining the original design of a representative organization for the whole profession in America. As the matter now stands the state and local societies are losing interest in the national organization. They do not think of making representatives or delegates even of their members who may be known to be intending to attend the national meetings, or recognize that they have any official connection with it whatever, which is not as it should be. This body should attract the attention of and interest the whole organized profession of the country. For this reason I have introduced, as an amendment to the constitution, a section in the article on membership as follows: "When any state dental association or organized state society fails of representation by delegates officially accredited and directed to the National Dental Association for two years, the names of permanent members residing in that state shall be erased from membership. This shall not be construed to prohibit permanent members from accepting credentials as delegates." If this does nothing more it

will direct the attention of members of this organization and the profession generally to our intention to retain its representative character and will serve to bring the fact of the existence of this body before some dental associations that seem to have forgotten it.

Another matter that seems to me important in engaging the state and local societies in this organization is the interest we may take in them. Originally the intention seems to have been that the corresponding secretary should compile a report for this body, showing in a brief way the work which had been done by these societies, so that we might know something of what they were doing. This was not well shown in the constitutional clause, and has been dropped. I have so amended this clause as to show its original intention, and to require of this officer a condensed report of the meetings and work of these bodies, which with judicious handling can be made interesting and very instructive.

The idea has also come to me that we might arrange to have members of the state societies receive copies of our transactions by a very simple arrangement whereby certain dues to cover the necessary expense should be imposed and collected for that purpose by the state organizations. This would give a much greater circulation and knowledge of our proceedings, increase our usefulness, and interest many more men. I have not embodied this thought in the constitution which I shall offer, but it would be a very simple matter to arrange in the future.

In the earlier years of this association the literary and scientific work seems to have been very satisfactory. The membership was smaller and not so many men wished to read papers or to discuss them. The interests of the members were not so varied as now, yet as I look back over the proceedings of past years there seems to have been no lack of interesting material. In such a review we naturally find that much which has been written and been said in discussion is what I should call "literature of the day." The papers that we can now designate as milestones marking the onward progress of professional thought are not especially numerous. In the natural order of things this could not well be otherwise. A new discovery or thought that serves as a decisive stepping-stone for advance is usually told in a few words or within the compass of a comparatively short paper. But the diffusion to the general pro-

fession of a full understanding of its scientific import and its variety of application to practice requires many papers and discussions which to some of us may seem trivial, or repetitions, or in some instances mere words, and yet they may and do serve to round out and complete the conveyance of the fund of information. These are therefore among the necessities of progress. Many papers adapted only to the day and occasion for which they were prepared interest but the few and have little or no value in permanent literature, yet they are really excellent and necessary productions.

While it would be perhaps wrong to say that there is or could be any conflict between the journals and association work, yet it seems true that the greater facility for reaching the professson through the dental journals now and formerly has induced many men to offer their thought through that channel rather than through this association. When offered to this body papers are read and hurriedly passed, often their publication is much delayed and they are forgotten, while if published in the better journals they go at once to those who are sufficiently interested to read them. It may be true that this profession is not yet a reading one, for not a large proportion of our men read dental literature widely and regularly, yet those who are interested in certain directions read articles which appear upon those subjects and through them there is diffusion of the information to a greater number. It is a great fault with our association work that so much matter is presented and allowed to drop without discussion, and that publication is delayed until it has passed from the memory of those who may have been temporarily interested. A number of times within my memory the delay in the publication of the transactions of this association has been exceedingly vexatious. This has been especially true for some years past, and now when we come to our annual session this year the papers and proceedings of the 1900 meeting have not yet appeared in printed form. Is it any wonder that careful, industrious, thinking men, those whom we most wish to hear in this body, turn to the journals for the presentation of their thought? I recommend that those officers who have in charge the making of the contract for this work shall see to it that such exasperating delays do not occur in the future.

Dentists are more and more inclined to specialize. When we meet together in a body like this some are interested in this direc-

tion and some in that. A may be annoyed at having to listen to a long discussion of B's paper, which happens to be upon a subject that does not interest him, and possibly two-thirds of the audience would gladly vote to close the discussion, yet B's paper is just what one-third of the members wish to hear discussed. This difficulty increases as organizations of this general character grow older and as the membership becomes larger, as ours is rapidly doing. Also, with the growth of the membership, with the increase in the ranks of able men, and with a riper general intelligence of the profession, there should be an addition to the number of those who are able to present instructive and valuable thought to this body, both in the form of papers and in the discussions of same.

For all these reasons it seems to be desirable that for its literary and scientific work this association shall be divided into sections in such a way that they will be able to do their work separately and at the same time. When this body had but twenty-three members the whole time of the four days allotted for its annual sessions was very profitably occupied. Now after more than forty years of growth, leading to greatly increased diversity of thought and personal interest, with a twenty-fold increase in membership, no more time has been given in which to accomplish our task. It is true that there has been an attempt to divide the work into sections, but as at present carried out this proves to relate to the preparation of same for presentation rather than to the doing of the work itself. It is still all appointed to come before the general gathering for its accomplishment. For this reason our program for a number of years past has been inordinately crowded, in fact, to such an extent that no part of the labor could be done deliberately and well: and the discussions especially have been in a great measure crowded out. This has led to what has seemed to be a very necessary censorship of the papers offered, which, however wisely performed, has given rise to a feeling of dissatisfaction in portions of the membership which is undesirable to say the least.

Again, on account of the diffusion of responsibility in the making of the program for our meetings, of which I shall speak more in detail later, men have been invited to read papers before this body, and have prepared same in good faith, yet when they have come here, there has been no time for them to be heard, so some have naturally felt that they were mistreated. While I am sure that

neither this body nor any of its official representatives have had any other than the kindest feeling toward the members who have thus been disappointed, the conditions under which we have labored have rendered such incidents very liable to occur. These criticisms are not made in any spirit of fault-finding, but to remedy existing imperfections in our plan of operation.

A full knowledge of these matters has induced me to make a careful and somewhat prolonged study of the workings of this association and the structure of the constitution which directs it. I have compared it closely with other similar organizations and their manner of operation, especially the American Medical Association, with which I have some acquaintance. I have compared the manner of doing work more particularly than the structure of the constitution under which the work is done, for sometimes the precedents of an organization will be found wiser than its organic law. In what I shall offer I have considered with care the probable effect of changes upon the conditions now existing and likely to exist in the near future, rather than the specific constitution of other bodies. During this study I have fully come to the conclusion that however perfect in its adaptation to our needs it may once have been, our constitution, with the great growth of the organization, now fails to meet its needs and should be subjected to rigorous revision. Still, much of it is good as it stands and should be preserved with but slight changes; especially that part relating to membership and to the manner of conducting the business affairs.

I am decidedly of the opinion that the strictly business side of such an organization as this should be lodged in the hands of a few, whose acts would be under the censorship of the main body without debate, and thus prevent the discussion of same consuming valuable time which should be devoted to our professional, literary and scientific work. It was with this idea that it was organized; that its existence is continued, and that members lay aside their professional duties at home and journey to its meetings, many of them at great expense in time and money. It is to facilitate and not to obstruct this literary and scientific work that the business side should be run. However, the business side of such an organization is essential, and for the highest success of the literary work it is necessary that the business be well and expeditiously done.

After a careful study of this point I am of the opinion that the

plans developed for conducting this part of the labors of this association are wise and good, and the amendments I shall propose in in this line will be only to strengthen it, and to more specifically define the duties of each officer, in order that each new incoming official will more readily comprehend his duties, and thus prevent in the future if possible the conflicts of opinion which have occurred in the past. I would certainly recommend to incoming officers a careful study of the constitution under which they labor, as a preparation for the safe and accurate performance of their duties; and to that end there should always be lodged in the office of the recording secretary a sufficient number of printed copies, so that they can have this opportunity. I had great difficulty this year in obtaining a correct one, and finally was compelled to borrow the secretary's official copy.

In the amendments I shall offer the literary and scientific side will be more specifically divided from the business side than under the constitution as interpreted in past usage. I propose to abolish the the plan of sections as they now exist and to substitute another which will concentrate the work in three sections, each of which shall have its own meetings for the reading and discussion of papers and reports. These three meetings will be going on at the same time in separate rooms adapted to their needs. Each section will have its own program, its own chairman and secretary to preside over its meetings and to report its literary and scientific work. These shall be elected by the general body in the same manner as the president. Each chairman I would have retain office as past chairman for two years after having presided for one session, and serve with the chairman as a member of the program committee for that section. The principal part of the formation of the program to be given to the senior past chairman in each section, so that he might have three years' study of the needs of his section as a preparation for this important task.

This will give a program committee of three for each section, one of whom will reside in each division of the country, with the president as the central officer, combining the whole into one program committee. This organization shall be responsible for the preparation and arrangement of the program for the annual sessions, subject only to the judgment of the executive council, to whom it shall report at its first meeting during the annual gathering for approval.

I have been very careful in the formation of this program committee, and have so placed its members that those having the principal responsibility for the making up of the program for the sections shall have been in official position in relation to the program for the third year when the principal responsibility shall be assumed, and thus will have had sufficient opportunity for the necessary study of the needs of the association. I am of the opinion that each program should be made up upon a well laid scheme of subjects, with a wise choice of men for their presentation, and it should in the main present a regular sequence of thought in the progress of the session, while permitting of sufficient variety. The value of our meetings depends chiefly upon the orderly formation of the program, but heretofore it has been impossible to obtain same because there has been too great a diffusion of the program-forming power with a total absence of unifying power expressed in our organic law.

The censorship that has been exercised over the papers presented to this body, and the influence it has exercised I have studied with much care. In the past it has given rise to some irritation, perhaps more than it would if members presenting papers understood better its meaning and general object. I will not pretend to say whether or not the function has always been wisely administered. In correspondence and private conversation with members I have found much objection to it, yet after studying all of its features, with a fairly good general knowledge of the material heretofore presented, and liable to be presented in the future, I believe it is best to continue it in a somewhat modified form, hoping that a wiser exercise of the program-forming power will do away with much of the necessity that has existed heretofore. I propose that papers offered shall go to the program committee for their judgment only when so ordered by the executive council, two of the committee being members of the council, as they will be better able to explain to that body the conditions and necessities under which papers are offered and the nature of the matter contained. This will lodge with them the liberty of examination and censorship of any papers they may see fit to receive, but does not impose the task of the examination of all essays before they are read, as has grown to be the custom in recent years. Another feature which will tend to reduce the friction is, as has been stated, that the formation of the program will

be more distinctly lodged in the hands of a few persons elected directly by the association, insuring greater care in choosing the topics to be discussed and the persons to present papers than has been the habit in the past. Indeed, when I came to study the present constitution with a view to its administration I found this function lodged somewhat indiscriminately with a dozen officers of sections and as many more standing committees, with no one especially designated to unify the scheme of the program for the season; and inquiry as to precedents for the plan of this work revealed much difference of opinion and practice. Actually, it was difficult to find out who, if anyone, was directly answerable for this work in the past. The amendment mentioned will fix this responsibility definitely.

After a somewhat careful review of the work done in years past I think the scheme of standing committees, to report on literary and scientific subjects as it now exists should be abolished, and that hereafter when this association wishes a subject examined and a report made, which seems not likely to be supplied by some member in the form of a paper, a special committee can be appointed to do that work. Generally, however, the suggestion, in the form of a request directed to the program committee by a number of members, that the examination of a certain subject is wanted, will be sufficient to bring forward a paper by someone skilled in that particular direction.

I find that some dissatisfaction has been expressed at the custom which seems to have grown up in the association of the election of officers of sections and the continuation of the personnel of certain committees year after year. This has been without any disposition to reflect upon the persons holding those places, but rather with the idea that better results would be obtained by passing them oftener from one to another. After looking this over carefully I have provided amendments which will cause all of these to be elected by the general session, and in such form that nearly all will rotate annually in the divisions of the country as is now provided for the president. There are certain officers in this body, however, who should be changed as infrequently as is consistent with good service. These are the several secretaries and the treasurer. Efficient men in these positions should be as nearly permanent fixtures as the willingness of the persons to serve will allow. This has been an especially commendable custom of this organization, and I have made careful pro-

vision for its continuance, yet in such form that new men may be chosen any year.

I propose that the meetings of this body be divided into annual sessions, general sessions, and meetings of sections. The annual session is constituted of the several meetings of the year. The general sessions are the convenings of the whole body for referring matters to and receiving reports from the executive council and acting upon them without debate, as is the habit of the past; performing the opening functions; hearing such reports or addresses as may be set for the purpose, and the election of officers. The first general session should be held at 10 a. m. on the first day and be adjourned at 1 p. m., by limitation of time if not adjourned sooner. On the other three days the general session should convene at 12 noon and stand adjourned at 1:30 by limitation of time if not sooner adjourned; but these should be so managed as to be adjourned at 1 p. m. as the rule—giving twenty minutes in which to refer business propositions and receive and ratify or disapprove the acts of the council without debate, and forty minutes for reports or an address, which is sufficient time. Then each section should meet separately in the afternoon and evening of the first day and in the morning, afternoon and evening of each succeeding day, presided over by its own officers, for the reading and discussion of the essays and papers of its own program or such clinics as may be determined upon. The program for the next twenty-four hours for each section should be announced in the general session each day, so that all members would know what was taking place.

This plan of operation would enable the association to accomplish fully three times the amount of work it is now doing, and I am sure same would be better done. I know that some among us would wish to hear every paper and all of the discussions that are presented in each section; and some others would particularly wish, because of the especial importance of same of course, to read their papers to the general session. But these things cannot be done if the association is to so work as to be of the greatest good to the greatest number. Furthermore, in the original invitation to read papers the places they will occupy will be expressed so that members called upon will know where they will be assigned. As for myself, I should rather present an important paper to a dozen interested men, and have their careful discussion of it, than to present it to a

thousand uninterested people, as I would gain more from the discussion, and the dozen men would be better able to impart the thought to others than would the whole thousand. I have grown weary of the rush of papers and the hurried discussions that have become common in this association, and hope that the future may give us more deliberate and careful work.

I hope also for a better feeling toward and a much greater interest in this association by the profession at large. As I look over the dentists of our country and the societies which are at work, I feel that the general sessions of this body should count a thousand interested men, and have many rather than a few separate vigorous working sections.

The time of the year at which we hold our meetings seems to be unfortunate. It is during the hottest season and just about when most of us wish to take our vacations and recuperate. It is not the easiest time for men to put forth their best energies in society work. I know from correspondence that a number of important men are absent from this annual session on this account, and for many years I could not attend the meetings because of the season. I never go to society meetings to rest but to work; and this is true of many of the men who are doing the most for dentistry. I hope that in the near future we will agree upon some other season for holding our annual sessions, and I suggest for consideration the third week in September or near the last of February. With a better time to meet and with improved plans of work, it is my belief that this association will be able to accomplish much more good for the people, for dentists and for dentistry than it has done in the past. The time is fast approaching when dentistry must make much greater advances along scientific lines and in the adaptation of these to its practice, or lose caste with the related professions, and we cannot allow it to do the latter.

I have also had in mind a scheme for the confederation of the national dental organizations now existing into one body, meeting at the same time or so closely together as properly to constitute one greater meeting in which all interests could be conserved and yet not be confused by being classed as departments or more distinctly defined sections, more fully controlled by those specifically interested in them and yet in a degree unifying the whole of the interests of the profession. The Faculties' Association might become the section

upon dental school government; the Pedagogic Association the section of pedagogics; the Examiners' Association the section on the enforcement of law, etc. The whole profession is interested in these subjects, and those who have them most in hand are interested in the general profession. Indeed, it is for the general profession all are working. In some of these organizations it has seemed to me that it might be better both for them and for the profession generally if there could be infused some of the steadying power that would come from a judicious expression of opinion by strong men not so directly engaged in professional work, and who are thus able to see the facts in a broader and more cosmopolitan way. Though this has been hinted at by some of my predecessors, it is probably too early in the present century to seriously consider these propositions, and I suppose they would best be passed for the present with this additional suggestion.

Now to briefly recapitulate the propositions of this address—First, in my opinion we have outgrown our present plans of work and they should be improved. Second, our business methods should retain their present form but express more definitely the duties of its several officers. Third, our present plan of doing all the literary and scientific work in general session should be abolished, and the same should be divided into distinct sections, presided over by officers elected annually by the general session. Fourth, the formation of the program for each season should be placed in the hands of one committee, with subdivisions to mark the sections, so that the responsibility of this important work is definite. Other proposed amendments to the existing document are only such as to carry out these objects and produce a smooth working scheme. The general plan of organization, the representative character, branch meetings, rules of order, etc., will remain the same as before.

Still, on account of the numerous word changes made it seems best and simplest to offer it as a substitute for the old document. I ask for these matters your most earnest consideration in the interest of our profession and the people whom we serve.

SECTION IV.

Physiology, Etiology, Hygiene, Prophylaxis and Electricity.

Etiology of Disease.

PAPER BY C. L. HUNGERFORD, OF THE SECTION.

It is one of the curious contradictions of human nature that all should shrink from physical suffering and put forth every effort to make it cease, and yet so assiduously, though perhaps with unrecognized intent, keep alive its moral equivalents—mental disquietude, selfishness and sorrow. It is self evident that if this world was once a sterile, incandescent globe what we now know as disease was entirely absent, and the purport of this paper will be an attempt to show that the physical body of man, evolving on parallel lines with his mentality, grows naturally and harmoniously, as the mind lends itself to the purposes of its incarnation or begets disharmony and disease, as the mind yields to the promptings of its molecular structure whose habits have been established in other kingdoms from whence they came into his body, and over which his mind now fails to exercise a control.

It is well recognized that an act performed by any set of cells will have a tendency to be repeated under analogous conditions. This is the basis upon which habits are formed, whether they be good or bad ones. As our bodies are composed of elements taken from the so-called lower kingdoms of nature, having come into our economy they naturally tend to reproduce the acts with which they are familiar, thus in varying degrees swaying the mind to yield to those bodily sensations which the molecules themselves have found to be agreeable. The mind, having thus yielded to the promptings of the

body, also tends to repeat itself, until an act at first painful eventually becomes agreeable and we have established a habit, or a physiological process if the habit is sufficiently prolonged.

Now, as all nature makes for evolution progress is possible only when life flows as a constant, steady stream through an unresisting vehicle. Then growth is painless and joyous, but if any impediment or cross-current is placed in the way by desires begotten of habits then disease becomes a factor and pain is the result; for all habits are contrary to the laws of evolution, habit being simply the repetition of an old act. The healthy man needs no tonics; his pulse leaps without their aid; but humanity is not happy; it needs the stimulus of pleasure or pain to make it feel alive, and it never will be either healthy or happy so long as it habitually yields to any habit whether of pleasure or pain.

All sensation commences with pain and all finally terminates in pleasure; but we must remember that pleasure ends in satiety or monotony, which is the most drastic form of pain known to humanity, and the latter end of that condition is worse than the first. The first is nature's warning that something is wrong, so the wise physician does not too soon give something to allay pain, but first endeavors to find the cause. The absence of pain in the case of any known lesion is a symptom of alarming gravity, for a body incapable of responding to pain is very near death. So, also, pleasurable sensation means simply the molecular response of acts that have become habitual and for the time being agreeable to the molecules; but if the habit is stronger than the informing principle which should govern it the result is satiety, disgust and disease.

Volumes could be filled in the elaboration of this idea, but what we wish to find out is, how did the molecules or cells first come into the acquirement of a habit. The time never was when matter did not exist, nor will the latter ever hereafter cease to be. Substance is as eternal as spirit and must have forever carried its impress, whether for good or ill, for spirit and substance are but the opposite sides of the absolute *all*. The molecules of the universe, then, were never without their informing principle—call it habit, chemical affinity, polarity, attraction or any word you may choose to express that atomic consciousness which is a part of all substance.

It will not do for the materialist to tell us that thought results from a mere fortuitous concurrence of molecules, for if thought is, it was

and will continue to be, and there is nothing new under the sun except change in form. It is likewise true that old diseases are dying out with the old thoughts that begot them, and new and strange ones are springing into existence as the result of causes that lie deep in the minds of men. To this extent each man is in fact and fancy responsible for diseases, for with every thought he adds to the sum total of the world's harmony or discord. Mr. Ingersoll, when asked how he would improve on the works of the Creator, replied that he "would make good health catching instead of disease." Had he been as much of an observer as he was an idealist he would have seen that good health and disease are equally catching, as we open ourselves to either one or the other, for men are creating their own bodies moment by moment. They are throwing the tendencies of the forces they have allowed to play through their brains upon every cell, and those tendencies of necessity become parts of their bodies. Is it likely then that the cells of the body will remain uninjured if dark, ugly moods are permitted to master a man? If the latter are repeated many times is it not natural to suppose that the cells will permanently alter—in other words become diseased? After a manner, to be sure, which the microscope may not discover, but which is nevertheless profound and affects, so to speak, the very life of the cell itself.

Knowing the currents that are rushing over the world to-day in its present condition, filled with beings ignorant of the purpose of life, it would be strange indeed if the earth were not covered and filled with disease. And then consider the intimate relation between mind and body, and that not a thought, which is a force, fails to exert its influence and make its imprint on the cells through which it flows. It is not unreasonable to suppose that a discouraged humanity to-day may be suffering from a heritage begotten during the dark ages of the world, when monastic orders were perpetually dissolved in tears and sought to shift the responsibility of their crimes upon the shoulders of a Saviour. The idea of vicarious atonement alone has liberated enough moral microbes to poison a solar system.

The object of life is the attainment of perfection and all nature is making toward that end. She produces and preserves for a time and then destroys her work, but nothing is lost or annihilated. The enlarged intelligence, the result of enlarged experience, builds

for itself a more perfect form. Good and evil can have no existence per se, but are simply conditions depending on one's standpoint in the scale of evolution. To look longingly below, because one has learned to do well the lower, and because incidentally it may be pleasurable, is at least a relative evil; to look to the unattained or the ideal is a relative good.

Pain is the outcome of evil and is nature's method of calling attention to the disturbance. Although we can find perhaps nowhere a perfectly healthy body, yet it has been sufficiently approximated for us to know the general method of its operation, and that it has a system which should yield perfect results. Frequent lack of health is not due to the inefficiency of the system, but to the interference caused by the evolving human mind. The mind possesses the power not only of receiving impressions but also of creating or embodying them. The thought of a lemon will so affect the salivary glands as to produce a flow of saliva. That is to say, through the mental creation of the sensation the organ or set of organs to which it belongs is physically affected; just as the sensation of sourness created in the mind will affect the salivary glands, increase the blood supply, and could doubtless if continued daily cause an enlargement of the glands. So the created sense of disease in some organ that is uneasy and out of gear could eventually affect that organ to its utter destruction. Is it not suggestive that a body which nature has formed perfectly to suit one mind would be totally inadequate to meet the needs of another?

Molecules group themselves to form cells. The cells combine to form organs, and though each has a specific function it is subservient to the purpose of the organ. This, though a distinct entity, having duties which in no wise resemble those of any other organ, is yet dependent on every other organ; let any one fail and the whole system is thrown out of key. All the organs of the body are under the control of the nervous system, which in its turn yields to the final authority of the heart, and it with untiring energy sends its impulses to every ramification of the body. Let this energizing force which works through the heart withdraw itself and the heart ceases to beat. The molecules, however, continue their separate existences, but disintegration sets in and the body as an organism ceases to be. But those molecules have been affected for good or bad results by the aspirations of the one who was the

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guide of the little universe they inhabited. When he dies he leaves them impressed with the color and force of his thought, ready to be used over again by other organisms in the building of other bodies. Thus a double responsibility devolves upon humanity by its thoughts and deeds: First, as to the effect produced upon matter that may be incorporated into other organisms; and second, upon the molecules themselves, their evolution being either aided or retarded by the proper or improper use man has made of the matter that was placed in his charge.

Hermetic philosophy holds that man is a copy of the great universe; that he is a little universe in himself, governed by the same laws that govern the greater, only reduced in time and sweep. Thus every cell is a life, and every life is part of the one life.

It would be of small value to know the etiology of disease unless to some slight extent at least it was suggestive of the remedy. Force being indestructible, it follows that the universal force is always unchanged in its totality and plays in every direction with equal intensity. The amount of pressure that we receive from it is regulated by the amount we consciously generate in ourselves. It rests with us to determine if the force shall play through us or upon us.

Without referring to physical details, which must of course be attended to, I believe the mental attitude is of at least equal importance. A meal eaten under proper conditions nourishes and strengthens; the same meal eaten in sorrow or anger is liable to produce indigestion. A long breath taken in joyous relief at work well done refreshes and energizes, a sigh further fatigues and depresses us; yet the action of the lungs and muscles has been almost the same in both cases. In combating bodily disease the endeavor should be to discover nature's method in dealing with its correspondent on the larger scale, which is that of pushing it downward to a lower plane or the one of least resistance and thus getting rid of it. It is true that those who desire to work evil and are upon the downward path can to a limited degree command nature's forces for evil purposes, but they do so at their own peril. All the force of the universe tends toward equilibrium, and mental destruction and bodily disease must attend those who seek to stem the current of the universe.

That all force works out on the line of least resistance applies as equally to diseases of the mind as of the body, and shows, not only

the rationale but also the great danger in the "affirmations" and "denials" of a certain sect that has so recently sprung into prominence. Were it possible to heal all disease by this means, it could but result in a far worse condition of moral and mental destruction and spiritual degradation. The price paid for evil has always been suffering, and happy is the man who is permitted to pay his debt upon the physical plane. It is axiomatic that all force is correlatable, and, if shifted from one plane it must appear upon some other. If mental treatment of disease should apparently destroy the consequences of the vice that produced it, it would permit the unhindered growth of vice and would be a total abrogation of all physiological law; and, in direct proportion to its success, would it make for permanent ruin.

The conservation of energy can not be confined solely to the material world, for growth would then be impossible. There could be but the repetition of some old act and never any progress toward a new one; but in the larger view every organism is, in varying degree, a focus or transformer for the unmanifested, unexpressed energy of the world, and according to the measure of capacity of the conscious intelligence that is operating through that body will evolution proceed. This further fact seems to show that where there is no conservation of energy there must be diffusion or disruption, or, as the Bible has it: "To him that hath shall be given, and from him that hath not shall be taken the little that he hath."

So, in tracing the various forces of nature through even a few of their correlations, we are forced to the conclusion that disease has no more existence of itself than has good or evil, but each is simply a condition produced in the vehicle through which consciousness is acting. Even the microbe pest is probably leading a perfectly physiological life as the ground upon which it is feeding yields to its ravages, or is living a perverted one as resolution is taking place.

That new diseases are appearing amongst us no well-informed physician will pretend to deny. They can not have sprung de novo, but somewhere and somehow must have had an adequate cause. That this cause lies in the mind I am thoroughly convinced. I do not mean that right thinking will make a perfect body, free from disease in a few months or years, for our bodies are the result of ages of thinking; but it will help to produce better bodies in the

future. The breeding of animals trained to special acts is now pretty well understood; humanity alone begets its offspring as a secondary consideration, and more thought is bestowed upon the first than the last.

That the emotional nature breeds toxins in the economy is now proven beyond controversy, and, since it has at last received the mint-stamp of regularity, it is recognized by the medical profession at large. It will be a great day for humanity when authorities, in sorting over nature's facts, shall be willing to acknowledge others than those that seem to bolster up their especial prejudices. To give an illustration, contrary to present opinions, one called from the ancients who, at last, are beginning to receive a tardy recognition of their tremendous knowledge of the cosmos in general and of man in particular, it is said that "we die not from lack of life but from its excess." When we arise in the morning fresh and vigorous, it is because we have less vitality in our system than when we lie down at night worn out with the day's work. If life is omnipresent and enters into the composition of everything it must be like water and assume the form of the thing into which it enters; but the human mind, like a great transformer, forces the body into more active vibrations during our waking hours than during sleep; as a consequence, more of the life principle will be forced into us, until the activity of the cells, forced far beyond their natural gait, become so excessive that we are forced to take a rest. An uncurbed mind would in a short time disintegrate both body and brain. An engineer would say that we have to blow off a little of the surplus steam, and lucky is the man who can consciously put his finger upon that safety-valve.

There is in our social and business atmosphere a deadly ferment. Its name is Self. It is the great heresy of separateness. Until we recognize that there is but one humanity; that we are all parts of the one life, just as there are many stars but only one light; that we have many brains but there is one mind that fills them all and each takes what he can; that man is of necessity his brother's keeper; that every thought we permit to enter into our minds adds to the sum of the world's happiness or misery—until we recognize and practice all this there will be little hope of banishing disease. However, I am optimist enough to believe that the dawn of that day has already broken; that he who from the mountain top views conflicting hosts

sees them even now making for a common goal. Some day they will meet and, joining hands—Capital and Labor, Science and Religion —there will be formed that mystic cross within whose charmed circle humanity shall toil and sweat no more in vain, but man's feet be placed upon the path that leads to liberation.

In conclusion, let me say that no man was ever converted to a *new* belief. If he comes into it it is because it is the extension of a previous one. In other words, if a man has no experience with which to correlate a new idea he can not expect to approve or understand it. If he has no mental niche into which a fact can be shot, so much the worse for the fact—perhaps.

Discussion. *Dr. James Truman*, Philadelphia: I never saw this paper until I heard it read just now, yet I am expected to talk on a metaphysical subject on three minutes' notice. I may have misunderstood the essayist, but I believe his idea is, that through the action of the mind the body can become diseased, and that to understand the etiology of disease we must study the effect of mental action on the organism. We all know that the mind acts upon the body, but are we to understand that pyorrhea, etc., are caused by some action of the mind? We often hear of toothache being stopped by the sight of the dentist's tools, and this is unquestionably the result of mental action upon the nerves. We also admit that it is possible for mind to so act upon the body as to cause occasional disease, and when the mind can be energetically acted upon disease is often overcome. This seems to be about the substance of the paper.

Dr. E. T. Darby, Philadelphia: I have listened with much interest to Dr. Hungerford's paper, because he has set forth therein that intimate and mysterious relationship which exists between mind and matter, but I do not see the bearing which has been put upon the subject that we are met to discuss, and I do not feel competent to discuss it intelligently.

Dr. M. Albrecht, Indianapolis: For six years I was afflicted with an eczema which would not yield to medical skill, but I was cured in six weeks with the help of metaphysical treatment, my physician and I living many miles apart. The study of this subject has given me the power to control in some degree conditions in my patients which have been a source of inconvenience. I used to frequently have to send patients home because they complained

of headache or cold or nervousness, but during the last two years I have told them that their ailment would not interfere with my work, and I would cure them, and I have cured dozens of colds, coughs and headaches in from five to fifteen minutes. Where the limit of my possibilities is I do not know, and if any of you will honestly investigate the matter and make it a sincere study, you cannot fail to confer the same blessing upon yourself, your patients and humanity that I have done.

Dr. J. W. Cormany, Mt Carroll, Ill.: Some weeks ago my brother at Cincinnati met with a very painful accident, and his friends and the physicians who treated him became much alarmed, believing that blood-poisoning and gangrene would set in. I said, "No, it shall not be," and from that time on—

The President: I think this is hardly on the subject of the paper.

Dr. Cormany: I just wish to give an illustration of the power of thought to cure disease. From the moment when I said it should not be all the unfavorable conditions subsided and my brother has remained in a normal condition without any rise of temperature, without anything to interfere with the perfect progress of the work of nature in his restoration. I spent $1,500 in one year without result to have my wife cured, and she has since been cured without medicine.

Dr. Wm. Crenshaw, Atlanta: In line with the bosh to which we are listening, I would state that a short time ago a gentleman told me that a friend of his in Chicago fell out of a twentieth story window and was coming down heels over head, when one of these Christian Scientists made a few passes at him from the other side of the street, and the man went right back up and crawled into the window, not being hurt at all.

Dr. G. V. I. Brown, Milwaukee: I wish to protest against an attempt to make ridiculous a beautifully worded, carefully thought out, and valuable scientific paper. Such a thing should not be done in this association. If the gentlemen had followed the line of thought suggested by the essayist in the matter of the pain habit, they would have found quite enough to occupy them along strictly scientific lines, without wandering into Christian Science or other subjects which we do not understand. No man who deals with neuralgic cases fails to realize that the pain habit is a real thing.

When we have removed the etiological factor per se we still have the habit, for the vibrations that produce manifestations of pain continue, and it often takes much care and patience to overcome the outward manifestations of the trouble.

The President: I trust that in the further discussion the gentlemen will confine themselves strictly to the subject of the paper.

Dr. Hungerford, closing discussion: We have so many papers on dentistry that I thought you might possibly enjoy something outside of it, and I was pained by the remarks of Dr. Darby, for I am sorry that any man can get to the point where he is unable to see that the acquirement of any knowledge is advisable. If Dr. Darby says that this subject has no bearing on dentistry, I would say to him as Goethe said to the man who knew only his own language, that he does not understand his own profession. I fear I am unable to speak any language, if I could have been so misunderstood by the gentlemen who talked on Christian Science. I said that in proportion as that idea made for success it made for the ruin of the individual, and it does. I thought that the whole tenor of my paper was against the ideas and practices of the so-called Christian Scientists. If it is possible to cure disease in the way they claim, then we may indulge in every sensuality and crime of the physical nature. If you can obliterate the effects of crime and vice, the result is the absolute and total destruction of the man himself. It is better that the body should be racked than that the mind should be destroyed, and it is better that a man should be a cripple than that he should be in a lunatic asylum.

As I was saying, the men who know nothing except their own profession know very little about it. One of the difficulties with many men in the medical and dental professions is, that they never pretend to garnish their minds with collateral sciences, with art and literature, and with all those studies which enable men to broaden themselves and to be of benefit to others.

ORGANIZATION OF THE DENTAL CORPS OF THE U. S. ARMY, WITH SUGGESTIONS UPON THE EDUCATIONAL REQUIREMENTS FOR MILITARY DENTAL PRACTICE.

SPECIAL REPORT BY JOHN S. MARSHALL, REPRESENTATIVE OF ARMY DENTAL EXAMINING BOARD.

Pursuant to an order issued by the Secretary of War, the Surgeon General of the U. S. Army convened in Washington, Feb. 18, 1901, the members of the examining and supervising board of dental surgeons. These gentlemen had been previously appointed by the Surgeon General and approved by the Secretary of War, on the authority of the provisions of the army reorganization bill, which was passed on February 2, to have charge of the examination of the candidates who were seeking appointment as dental surgeons in the U. S. Army. Orders were thereupon issued to the Board to immediately formulate the plans for the examination, and to be prepared to receive the first class of candidates upon Feb. 25.

The Board after due deliberation presented to the Surgeon General the following plan: *First.* The candidate should be required to pass a satisfactory written and oral examination upon the following theoretical subjects, which form the curricula of the colleges that are members of the National Association of Dental Faculties, namely: Anatomy, Physiology, Histology, Physics, Metallurgy, Chemistry, Dental Anatomy and Physiology, Dental Materia Medica and Therapeutics, Dental Pathology and Bacteriology. Orthodontia, Oral Surgery, Operative and Prosthetic Dentistry. *Second.* They should prove to the satisfaction of the Board their ability to perform all of the usual dental operations and laboratory work by clinical tests upon patients furnished for that purpose. These

tests consisted of—*Operative Dentistry:* 1. The examination and record of condition of mouth and teeth. 2. Preparation of cavities with hand and engine instruments. 3. Instrumentation and technique. 4. Preparation and manipulation of filling materials. 5. Insertion of fillings. 6. Treatment and filling of root canals and preparation of root for pivot crown. 7. Manipulative technique in removal of calcareous deposits. 8. Application of rubber-dam, metallic separators, matrices, etc. 9 Diagnosis, prognosis, and treatment of oral diseases. 10. Care and sterilization of instruments and hands. *Prosthetic Dentistry:* 1. Impressions in plaster paris and modeling compound, casts, bite and articulation. 2. Construction of a denture in vulcanite. 3. Construction of die and counter-die from model to completion, carving the endentulous model from a solid block of plaster paris. 4. Construction of swaged plate, with metal and rubber attachments, also two shell crowns (bicuspid and molar) and one Richmond crown. 5. Construction of interdental splints (Dunning and Kingsley).

An average of seventy-five per cent was required in *each* subject for the theoretical and eighty-five per cent for the practical examination. This was to make it certain that none but skillful operators would succeed in obtaining an appointment. In marking the papers, and in grading the operations on the teeth, the methods of treatment, and the prosthetic work, a rigid system was suggested so that every candidate would be graded according to his merit. This plan was approved by the Surgeon General and has been conscientiously carried out by the Board. These examinations covered just two weeks with each class, one week being devoted to the theoretical subjects and the other to the practical work. The patients which were furnished for the clinics came from the General Hospital, Washington Barracks and Fort Meyer; while many of the officers of the army on duty at the war department have been glad to avail themselves of this opportunity to have their teeth treated and put in a serviceable condition. By this system of examinations the Board felt sure that it would be able to weed out the ignorant and incompetent applicants, and believes it has succeeded in so doing.

We were assured at the outset by the Surgeon General that no political pressure from any source would be brought to bear upon our Board in favor of any candidate; but if there should be, our duty was to pass upon the professional fitness and aptitude of the

candidate for the service, as required by the law which called our Board into existence, and our report would be final. There has been some fault-finding by the friends of some few candidates who failed to pass these examinations, and the cry has been raised that the examinations were "too rigid," "too high," and "too medical," but this is really the highest compliment that could have been paid to the work of the Board.

The examinations of the Board have proved that those gentlemen who had been out of college for any considerable number of years generally failed in the theoretical examination, while those that had recently graduated failed in the practical examinations. The majority of those candidates who successfully passed the examination had been in practice from two to four years. These men as a rule took high standing in their practical work, and this is also an evidence that they had kept up with the studies of the theoretical department.

The results of these examinations are as follows: Number of candidates invited to take the examinations, 86. Declined to ap-appear, 6. Failed to appear, 10. Total number examined, 70. Found qualified and approved, 19, or 27 1-7 per cent of the number examined. Physically disqualified, 8, or 11 3-7 per cent of the number examined. Fully examined and rejected, 3, or 4 2-7 per cent of the number examined. Failed in theoretical examination, 7, or 10 per cent of the number examined. Withdrew before completing theoretical examination, 33, or 47 1-7 per cent of the number examined. Average age of approved candidates, 27 2-12 years. Candidates examined who were graduates in both dentistry and medicine, 1. Number of persons appointed by the Surgeon General without examination by the Board, as provided for in the law, 5. Total number of dental surgeons now in the Army, including the three members of the Board, 27. Vacancies yet to be filled, probably in the Autumn, 3.

It will perhaps be interesting to know the states and territories from which these gentlemen came: Alabama, 1. California, 1. District of Columbia, 2. Iowa, 1. Maryland, 1. Massachusetts, 1. Missouri, 2. Montana, 1. Nebraska, 1. New Jersey, 1. New York, 1. Ohio, 1. Pennsylvania, 2. Washington, 1. West Virginia, 1. Wisconsin, 1.

The following is a complete list of the members of the Corps and their present stations. Members of the Board—John S. Marshall,

President, Presidio, San Francisco, Cal. Robert T. Oliver, Recorder, Manila, Philippine Islands. Robert W. Morgan, Member, Havana, Cuba. Robert P. Updike, Fort Leavenworth, Kan. Edwin P. Tignor, Fort Riley, Kan. William H. Ware, Philippine Islands. Hugo C. Rietz, Philippine Islands. Ord M. Sorber, Fort Sam Houston, Tex. William C. Fisher, Fort Sheridan, Ill. John H. Hess, Military Academy, West Point. Ralph W. Waddell, Philippine Islands. Seibert D. Boak, Philippine Islands. Franklin F. Wing, Philippine Islands. George M. Decker, Island of Cuba. Frank P. Stone, Philippine Islands. Frank H. Wolven, Philippine Islands. William H. Chalmers, Fort Monroe, Va. George L. Mason, Philippine Islands. Clarence E. Lauderdale, Philippine Islands. Jean C. Whinery, Philippine Islands. Charles J. Long, Philippine Islands. Hugh G. Voorhies, San Juan, Porto Rico. Appointed from the Army—Emmett J. Craig, Philippine Islands. Samuel W. Hussey, Philippine Islands. Charles A. Petre, Philippine Islands. Douglas E. Foster, Philippine Islands. Alden Carpenter, Philippine Islands.

The Board, after being in continuous session for five and one-half months, from six to eight hours each day, and often being obliged to devote the greater part of its evenings to marking papers and other work pertaining to its official duties, finally adjourned sine die on July 31, 1901.

The examination of the candidates, however, was only a small part of the work that the Board found to do. It was early recognized in our deliberations that successful practical examinations could not be conducted except by the aid of a complete operating and laboratory outfit. We therefore recommended to the Surgeon General that two complete outfits be purchased at once and set up in suitable quarters for the use of the Board. This was immediately approved by the Surgeon General, and orders were issued by the Secretary of War, instructing the Board to proceed at once to Philadelphia and purchase such outfits. These were shipped and set up ready for use by the time that the first class had passed its theoretical examinations.

The next most important question in the organization of the corps was the selection of the general or field outfit. This was no insignificant undertaking, because it was exceedingly important in the selection of the furniture, instruments and supplies, that they be as light as possible, for the reason that transportation in an army

is always a serious consideration. Consequently, the lighter the weight of the outfit the better from this standpoint. After the furniture, instruments and supplies had been selected, it was necessary to have special chests devised to hold them, so that they would not be displaced or broken in transportation.

Each dental surgeon is furnished with one of these outfits, which contains all necessary instruments for operations on the teeth and sufficient supplies for a three months' service. It is so light that it can be carried upon the backs of two mules, together with an army field desk, two folding tables and two folding chairs. Another important question was that of preparing a nosological table for the use of the corps. The object in preparing this table was to secure uniformity and the same nomenclature in the register of dental operations and in the monthly returns. For the same reason a system of designating the teeth by numbers, of describing the location and the character of cavities of decay, the kind of filling material used, the nature and character of other operations, and the treatment of diseased teeth was designed by the use of letters and a combination of letters, which is so simple that any hospital corps private could master it in an hour or two of study.

These records if carefully kept will prove of great value after a few years in the study of the etiology of dental and oral diseases, and will also be of considerable value to the Pension Office in detecting fraudulent claims for pensions by reason of physical disability claimed to have been induced from the loss of teeth while serving in the army. These records will show every form of dental operation that is performed upon each officer and enlisted man, and every form of disease treated.

According to the provisions of the army reorganization bill, which incorporated the bill prepared by your committee on National Dental Legislation, the number of dental surgeons to be employed in the army was reduced to thirty. As a consequence of this the dental corps will be for a time at least the hardest worked branch of the medical service. Private letters received from those of the corps who have already reached their stations prove this statement to be true. One says: "There is more immediate dental service needed at this post than three men can perform in six months. I am working over hours to relieve the necessity." Another says: "I find plenty to do, more in fact, than I can do." The bill pro-

vides, however, that free dental service can be rendered only to the officers and enlisted men of the regular and volunteer armies. The army regulations fix the hours of service at 9 A. M. to 4. P. M. During these hours the dental surgeon is expected to devote his entire time and attention to the care of those persons who are entitled by law to his services, except in cases of emergency, but after these hours he may attend civilian attachés and others who may request treatment, and for this he is permitted to charge a regular fee. He is, however, required by a special rule of the Surgeon General to state upon the monthly returns how many civilian attachés he has treated during each month. This was thought to be necessary as a check upon the temptation to neglect regular duty for that which would pay better in dollars and cents. There will be many opportunities of this kind presented, and to one who is not afraid of work a considerable sum may be earned during the year, enough to increase the income to a figure commensurate with the dignity of a professional calling. The hours for regular service are so fixed that the dental surgeon will have at least two hours each day that he can devote to the treatment of the families of the officers and enlisted men. I believe, however, that if the corps becomes a permanent organization the courtesy of free dental service will be extended to them, just as it is now the case with medical and surgical treatment, and I am inclined to think that this would be better from the standpoint of the highest efficiency of the corps, and only a just concession to those who are ever ready to defend our country against a foreign foe, even at the cost of their lives; while their pay is so small in many instances that there is no possibility, with a family to feed, clothe and educate, of laying by anything for old age

In closing this part of my communication I desire to say, that I have been assured by scores of officers of the regular army whom I have met in Washington that our corps will be most cordially welcomed wherever it may be sent, for there is dire need of its services, and this is especially true in Cuba, Porto Rico and the Philippines. We are also encouraged by these gentlemen to believe that it is only a question of time when the corps will be made permanent by giving its members commissions. It will be necessary, however, in my judgment, before commissions can be obtained to first prove two things, namely—Is the corps necessary to the health and efficiency of the army? And does it pay in dollars and cents? These will be

the questions that must be answered to the satisfaction of Congress before any more legislation along this line can be expected. After the Philippine Islands have been pacified and the war is really ended retrenchment in the expenses of maintaining the army and navy will come prominently before Congress. Sentiment for the soldier will by this time have disappeared, because of the fact that the volunteers who have friends in every community are now all at home, and there will no longer be any strong political influence brought to bear upon our senators and congressmen on behalf of the regulars. Cold facts will then be the only power that will move Congress to increase the expenses of maintaining any department of the army. We must convince Congress that our corps is not only necessary to the good health, and consequently to the efficiency of the army, but it must be shown that it pays; that from a financial standpoint it is a matter of economy; that by having dental surgeons in the army much loss of service from incapacity for duty, resulting from dental and oral diseases, and by reason of necessary leave, often of weeks, in order to have troublesome teeth treated and filled, will be prevented. When the balance-sheet is presented to Congress it must be shown to be in favor of the government, if the corps is to be made a permanent feature of our military establishment. This I trust we shall be able to do. We have been given a chance to prove ourselves a beneficent profession in an entirely new and untried field, with no precedents to guide or experience to warn us of the dangers in our pathway or of the obstacles to be overcome. But I believe that the young men who form the dental corps of the U. S. Army will prove themselves equal to the occasion and bring honor upon the profession to which they belong.

Suggestions Upon the Educational Requirements for Military Dental Practice. The army dental surgeon, by reason of his military surroundings and associations, and the isolated position in which he will often find himself professionally, will need to be broadly educated, and so expert in his calling that he will be capable of managing any case that may be presented to him for treatment. Many times he will be so placed, as for instance, at a remote post upon our western or southwestern frontier, in Cuba or the Philippines, that he can by no possibility obtain the aid of a suitable consultant or advisor; so he must rely entirely upon his own judgment and experience in conducting his cases. It therefore becomes

necessary that his general education shall be upon broad lines and his professional knowledge as complete as possible upon every department of dental practice. This should also include a good knowledge of general Materia Medica and Therapeutics, Physical Diagnosis, Urinary Analysis, and the general Principles of Surgery. This is necessary if the members of the dental corps are to fill their positions with credit to themselves and honor to the profession.

In considering the character and the scope of the examination of candidates for appointment as contract dental surgeons in the U. S. Army, the Examining Board took into account the special and peculiar conditions likely to obtain in military dental practice, and the adverse criticism which would be likely to come from our confreres, the army surgeons, if we passed incompetent men. The examinations in both the theoretical and the practical subjects were so outlined as to cover so far as possible every feature of dental practice, and those general medical and surgical subjects which are necessary to be known by one who must, when occasion requires, be able not only to prescribe constitutional remedies for the relief of those general conditions which are often present as existing causes or complications of dental and oral affections, or are associated with certain surgical diseases of the mouth and jaws; but must also be able, by conducting a physical diagnosis, to determine the condition of the heart and of the lungs, and by urinary analysis ascertain the condition of the kidneys, and thus determine if an anesthetic can with safety be administered; which anesthetics are indicated or contraindicated; whether or not a surgical operation can be made with any degree of safety to the life of the patient, and the best method to be pursued in the operation under consideration.

In fairness to the Board it should be said that the questions which have been submitted to the candidates have all been of an eminently practical nature, and so selected and presented as to test their general knowledge of each subject and their ability to apply this knowledge in a practical manner.

To prove this, let me say that the examination questions in general anatomy were confined to the bones, muscles, blood-vessels and nerves of the head, face and neck. In general physiology they were confined to the functions of digestion, of the circulation, of the nervous system, especially those of the cranial nerves and the vasomotor system, of the liver and of the kidneys. These physiological

functions have all a more or less important bearing upon the normal and abnormal conditions of the teeth and of the oral cavity. The questions in histology were confined to the origin and minute structure of the teeth, bones, oral mucous membrane, salivary glands, mucous glands, gums and the tongue

In physics the questions were simply elementary and composed of the tables of the metric system, the principles of the lever, the the screw and the inclined plane; the divisions of matter, the methods of obtaining the specific gravity of various bodies, the differences between atomic and molecular weight, etc. The questions in metallurgy covered similar ground, namely, the classification of metals; the origin, preparation and physical characteristics of the metals employed in dental surgery; their specific gravity, atomic weight and fusing point. The making of dental alloys, solders and gold plate of various carats. The value of platinum, silver and copper as alloys in making gold plate for dental purposes. The principles governing the use of fluxes in melting metals and in soldering, etc. In chemistry the questions were also largely of an elementary character, dealing with those substances chiefly employed in dental surgery, with usually one or two questions on organic chemistry and analysis either of the saliva or of the urine.

In dental anatomy and physiology, dental materia medica and therapeutics, dental pathology and bacteriology, orthodontia, oral surgery, operative and prosthetic dentistry, the questions were comprehensive and searching and intended to thoroughly test their theoretical knowledge of these subjects. The practical examinations in operative dentistry were conducted in an operating room with all the conveniences in furniture, apparatus and instruments that are to be found in a first-class dental office, while the practical examinations in prosthetic dentistry were conducted under equally favorable circumstances.

A less rigid and searching examination than this the Board felt ought not to be expected; in fact, the dignity and honor of our specialty, and the future high standing and efficiency of the army dental corps, demanded that the examinations be as rigid and as thorough as the courses of instruction in our best dental colleges would make practicable. The members of the dental corps will naturally be compared in general education and professional attainments with their brethren of the medical corps, and it is to be hoped

that in this comparison those of the same age and experience will make a favorable showing.

In order to stimulate the members of the corps to be studious and progressive, a system of examinations and promotions should be established, and doubtless will be, so soon as the value of the corps as a promoter of the health and efficiency of the soldier as a fighting machine is proved. In order to accomplish this the corps must be commissioned and a sufficient number of higher grades established to make the prize worth working for.

The results of the examinations of our Board have shown very conclusively that we need to spend more time upon the theoretical subjects of the curriculum than we are now doing, if we would thoroughly prepare our graduates for army dental practice. This was shown by the fact that nearly all the candidates who failed in their examination were deficient in those subjects which are classed as the fundamentals, and of these the majority failed in anatomy, physiology, histology, physics, metallurgy, chemistry, dental materia medica, therapeutics, dental pathology and bacteriology, and the principles of surgery.

Please do not misunderstand me upon this point, for I make no criticism upon our system of technical teaching, nor would I suggest that one hour less time be spent upon the practical subjects of the curriculum, but I would urge that more time be devoted to laying the foundations of a broad and comprehensive scientific education. This is just as necessary to a successful practice as it is to be an expert finger craftsman. The dental surgeon who knows little or nothing of the sciences upon which his profession is founded cannot by any just claim ask to be classed as a professional man. If he has only finger-craft ability he is nothing more or less than an artisan.

This is a practical age and we are a practical people. Our young men and women as a rule chafe under any system of education which does not fit them to earn a livelihood by the time they reach their majority, and this is particularly true in medicine and dentistry. The evil which underlies all this is the ambition to obtain wealth and position by the shortest possible route, regardless of all other considerations. As a result young men in great numbers, with little or no suitable qualifications for a professional life, constantly clamor for admission to our medical and dental colleges,

much to the detriment of the high standing of our profession and of our colleges, for the temptation is very strong when there is a deficit in the college treasury to wink at the meager qualifications possessed by the applicants for admission, and trust to the future to correct this deficiency. Occasionally our confidence in these individuals is rewarded, but more often we are woefully disappointed in them.

Candidates have presented themselves before our Board who were unable to write a sentence of twenty words without misspelling at least one-fourth of them. This is no exaggeration, but a plain statement of facts. Many could neither speak or write without transgressing many of the rules of English grammar. We, however, are not alone in this, for the Army Medical Boards now in session are having the same class of candidates come before them. I need not say that such men did not succeed in passing the examinations of the Army Dental Board, for they generally gave up the attempt after trying two or three subjects.

The result of these examinations, it would seem to me, prove very conclusively that there is great need of raising the standard of the entrance requirements of our dental colleges, and of lengthening the course of instruction to four years, so as to be able to devote more time to the theoretical teaching. Our motto in dental education should therefore be "Excelsior."

Discussion. *Dr. B. Holly Smith*, Baltimore: It seems to me very appropriate that the president of this Association should have invited the chairman of this army examining board to present to us a record of the work which has been done. Some years ago the presidents of the various universities of this country met in conference, and the president of the Chicago University stated that it was well for the east and west to confer as to methods, etc. The president of Yale said that reminded him of a moose story. Some years ago, when the moose was almost an extinct animal in the east, a man possessing a live one went through the towns of New England exhibiting it. The admission fee was ten cents, and for families twenty-five cents. One day a man with a wife and eleven children came to the show and passed over his quarter. The exhibitor looked somewhat surprised and asked if the entire aggregation belonged to the one man. Upon being informed that it did he handed back the twenty-five cents to the father and said, "Walk in.

It is just as important that my moose should see your family as that your family should see my moose." Now, I claim that it is just as important that Dr. Marshall should be in possession of our views as that we should know his. Without criticising him at all, as I have the highest confidence in his good judgment and ability, I think the examination has been a very trying one. Invariably those men who have taken it have afterwards presented evidences of physical disability. The board may have thought this was necessary, but I should call it monstrous. I do not believe that the welfare of or the respect for American dentistry stands today upon the foundation of a knowledge of collateral branches. A dentist is respected when he is a man of honor and a capable practitioner of his own specialty. America leads the world today because of the initiative taken by her young men, not because of the broadening of their culture or their extended opportunities for learning. Enough men will be graduated from universities to protect the interests of dentistry along this line. Above all things a man should be in touch with the professional life of his community, and I therefore offer a resolution that the secretary of this Association be instructed to request the Surgeon-General not to accredit anyone as an applicant to this board for examination who has not the indorsement of his local or state society. The Surgeon-General assumes the responsibility of receiving the applications and nominating those persons who shall take the examination, and I am sure that he will accept our resolution as a respectful request. I believe it would have been better to have had a conference among examiners experienced along this line, so that the examination might have more nearly approached the usual form, and so that it might have been determined what was a fair and practical test.

Dr. Wms. Donnally, Washington: In justice to the Surgeon-General I must say that he is not responsible for all appointments, as in an informal conversation he asked me to say to the profession that his first and second choices were turned down by the Secretary of War, and that one appointment was thrust on him. Dr. Marshall states that there has been some fault-finding by the friends of a few candidates who failed to pass; and further, it has been charged that the examinations were too severe, too high, too medical, etc. We must expect this, but not be alarmed by it. It was the wish of the Surgeon-General, the board and the profession that only those

men should be passed who were truly representative. I do not believe that the examinations have been too high from a dental standpoint, but I do think that the examination has been "too medical." At the start Surgeon-General Sternberg stated that there must be a distinct line between the field of the army surgeon and that of the army dentist, and our greatest danger, in my opinion, is in extending into the province of the army surgeon to such an extent as to arouse antagonism and opposition. The dentist as he is in civil practice was declared essential to the army by those at the head of affairs. My idea was and is that the functions of the army dental surgeon should be described in general terms, and should be developed by experience rather than by aggressiveness at the start, always having respect for the limitations and for the well established lines that exist between medical and dental practice in civil life. Dr. Marshall stated that the board goes into the subject of general therapeutics and general surgery, to determine whether candidates are capable of treating certain constitutional conditions that will come under their observation. This implies the very thing that we thought it was necessary to avoid. All knowledge is valuable, but it would be just as essential to successful practice for the army dentist to know something of engineering. To require a dentist to know how to make analyses of urine in order to determine whether a patient can safely take an anesthetic is carrying theory a little too far. Such a practice is not carried out nor advised by either physicians or dentists in or out of the army.

Regarding the permanency of the corps, according to the idea that obtained in Congress, in the military committee, and in the mind of the Surgeon-General, this was an act of Congress based on the necessity of providing the army with dental surgeons, and it was not regarded in any sense as an experiment. Commissioned positions are not necessary to permanency. The hospital corps is not commissioned, yet it is permanent, and so the dental corps is permanent.

Some men have complained that so soon as they failed to make seventy-five per cent in such subjects as physics and chemistry they were shut out and not given an opportunity to take an examination on those things which are regarded as essentially dental. The requirements regarded as most essential in practice came later in the examination, those which must be regarded as collateral coming first,

yet Dr. Marshall reports that only three of all those candidates examined failed in the former subjects. Now, if it is right that the army dentist shall be required to pass an examination different from the requirements of any state board of examiners or of any reputable dental college, the law should be changed to make such action legal, but if it is not right the board should be guided by the law as it stands.

I make these criticisms without feeling, except an intense interest for the good of the cause, a cause which has taken much of my time and attention for the past few years. I hope to see every worthy man in the corps succeed, not alone for himself, but for the sake of the profession and the welfare of the army. I want him to demonstrate that we can accomplish all we have promised to do for the army, and I trust to see him help reduce the pension list. I wish to see him demonstrate that he is absolutely necessary to the treatment of certain diseases, but he must do so as an educated dentist, to the credit of dentistry, and not under a pretense made for him which discredits dentistry and the dental profession.

Dr. James Truman, Philadelphia: I heard with regret that part of Dr. Marshall's paper wherein he criticises the education of those who came up before the examining board. He speaks of spelling and grammatical construction as indicative of education or the lack of it. Now, all educators know that spelling is not a proper test of a man's education, for there are many individuals who can spell under ordinary circumstances and when not mentally disturbed, but in an examination they cannot think of words, spelling or grammatical construction. Furthermore, many cultivated college-bred people cannot spell correctly. I trust Dr. Marshall will eliminate that portion of his paper before it is published, for as the matter now stands it will go out to the world that a large proportion of the dentists in this country are uneducated men.

Dr. R. T. Oliver, Washington: As a member of the board I would say there were fifteen subjects for examination, and we figured each man's standing after he had completed a group of three. If he fell below fifty-five per cent we concluded it was hardly possible for him to reach the requsite seventy-five per cent by an oral examination. If his written and oral examination on these three subjects was low the fact was stated to him, and if his rating was below the required percentage it was suggested that he withdraw.

This was done so that the young men might avoid the expense which they would incur by remaining the two weeks which it would take to give them a final rating. If a man passed on the first three subjects the next three were given him; and so on. Every one who was given this permission to withdraw thanked us for the consideration. Let me mention some other points.

Dr. W. C. Barrett, Buffalo: Mr. President, am I not correct in believing that the most of us care very little for the details of this business, being satisfied with the general results?

Dr. Oliver: Just a word in conclusion. Those subjects which seemed to pertain to the practice of medicine were in reality fundamental to dentistry, and the examination was conducted on a high standard because we felt that the dental surgeon in the army should have a standing in his profession equal to that of the medical men in theirs or to that of the field officers in theirs, so as to put them on an equal plane if possible. I did not know that the law defined the standard.

Dr. Donnally: As you have been operating under it for six months I supposed you knew what the law was.

Dr. Marshall, closing discussion: I cannot see any reason for all this talk about the work of our board. When the board first organized we determined that our first duty was to protect the honor and dignity of the profession, and our second was to see that no incompetent men got into the dental corps. This is what the law authorized and what you expected us to do. To the best of our ability we have tried to do what we thought was right, and when some of you get cooled off I believe you will admit it.

SECTION V.

Anatomy, Pathology and Surgery.

Attachment of Implanted Teeth.

PAPER BY W. C. BARRETT, OF THE SECTION.

There has been a great deal of speculation concerning the exact nature of the secondary formation which attaches teeth in instances of replantation or implantation. The theory has been advanced, and is still held by many, that it is by a true bony ankylosis. This seems impossible when we consider all the homologies of the case. The connection of the tooth is a true articulation by gomphosis. All arthroses, or jointing of one bone to another, must be either movable or immovable, or of a mixed type which need not now be considered. I present a simplified tabular arrangement of them:

ARTICULATIONS.	SYNARTHROSES. (ImmovableJoints)	SCHINDYLESES. (Grooved Joints.)	Ethmoid and Vomer.
		GOMPHOSES. (Socket Joints.)	The Teeth.
		SUTURES. (Serrated Joints.)	Lambdoidal, Saggital.
	DIARTHROSES. (Movable Joints.)	ARTHRODIA. (Gliding Joints.)	Metacarpal, Metatarsal.
		GINGLYMUS. (Hinge Joints.)	Elbow Joint, Ankle Joint.
		ENARTHROSES (Ball and Socket.)	Hip Joint. Shoulder Joint.
	AMPHIARTHROSES. (Mixed Joints.)		Body of Vertebræ, Symphisis Pubis.

The biarthroses, or movable articulations, are of three kinds: (1) The arthrodia, or gliding joints, in which the bones move upon plane surfaces. (2) Ginglymus, or hinge-like joints, with only backward and forward movements. (3) Enarthroses, or ball and socket articulations.

The synarthroses, or immovable articulations, those without any synovial cavities are: (1) Schindyleses, those in which a plate of one bone is received into a fissure in another, a grooved attachment. (2) Gomphoses, in which a process is inserted into a socket. (3) Sutures, in which there is a serrated interlocking of bony processes. In all these methods of articulation there must be a separating membrane which prevents union of the two articulated surfaces, and without such membrane there can be no true articulation. Even in the closest sutures it exists; and in the synarthroses it is usually very persistent, save in extreme old age. The attachment of the teeth is by a true gomphosis, the root being inserted into a bony socket, the articulating membrane being the pericementum.

In the diarthroses, or movable articulations, the attachment is more compound than in the immovable joints, and there is a synovial cavity and membrane, whose office it is to furnish a lubricating fluid for the movable joint. It is possible in cases of arthritis for the synovial cavity to become obliterated and the mobility of the articulation be thus lost. Then a condition analogous to that in instances of fracture of a bone may succeed. As a direct result of the succeeding inflammation, plastic lymph is deposited, and in process of time organized into osseous tissue, uniting the two bony surfaces and forming a true ankylosis; but in such instances it is a union of homologous tissues—bone is united to bone.

While the teeth for anatomical purposes may be considered as bone, they are really such modifications as make them analogous but not homologous to it. Their structure is not identical with that of bone, but materially differs from it. It is a law of nature that unlike tissues will not unite; they cannot be joined together to make a homologous whole. In biology the identity of species is maintained through the fact that one cannot be fecundated by a different one. If two of them are so nearly homologous that hybridizing is possible, the issue is usually sterile and cannot procreate and erect the hybrid into a separate species.

The structural difference between bone and the dental tissues is

quite marked. In the former we have the regular concentric arrangement of the lacunae around a nutritional center—the so-called lamella. Cementum, which is nearest to bone in structure, is without this lamellar arrangement, while it retains the lacunal corpuscles and the canaliculi or communicating fibres. Dentin has lost the lacunae, but retains the canaliculi in their analogues, the dentinal fibrillae. Enamel has lost even the canalculi and is practically without organic structure. The differentiation of enamel from dentin, or of dentin from cementum, is not greater than that of cementum from bone. No one ever claimed that dentin and cementum are sufficiently homologous to permit of their union. How, then, shall bone and cementum become one? Yet this must practically take place if ankylosis is accomplished.

The usual conception is that the pericementum of the implanted tooth being destroyed, the union will be analogous to that taking place when the ends of a fractured bone are united; but in the latter instance the sundered or fractured tissues are absolutely homologous—identical in structure. With the implanted tooth there is nothing more than an analogy existing between its cementum and bone. Admitting that the plastic exudate, or lymph, is the same in implantation that it is in fracture, into what shall it be organized for the purpose of uniting tooth and its investing bone? Into osseous structures? But they are not homologous with cementum and will not unite with it. Into cemental tissue? But that is not homologous with the bone and will not consolidate with it. Is there a possibility of such a modified hybrid structure as may blend with both? No such structure is known to anatomists or histologists or has ever been demonstrated.

If a modified ankylosing tissue were possible, what would be its genetic origin? Bone is organized either by calcification of a cartilaginous matrix or through the action of a membrane. Ankylosis presupposes the absence of any membranous organ; but cemental tissue is positively of membranous derivation, and any modification of it must have at least a modified membranous matrix.

Admitting that the ankylosing tissue is of a bony character, how shall it be nourished? That requires either some nutritive membrane or the lamellar structure of bone. There being no Haversian system in cementum, or in any tissue which could unite with it, there follows the inevitable conclusion that, admitting the possi-

bility of an ankylosing structure, its integrity could not well be maintained by any practicable nutritive currents.

The pericementum of an implanted tooth being destroyed, the vitality of the cementum, which is dependent upon it for nourishment, must in case of ankylosis be an impossibility. Under such circumstances it is in the highest degree an absurdity to suppose that the ankylosing tissue could become attached to it. The living does not identify itself with the dead, the one functional and the other functionless.

In case of loss of an implanted tooth, it is always through the formation of osteoblasts or giant cells, and the resorption of the root succeeds precisely as in the case of the normal removal of the deciduous teeth. It is well known that secondary tissue is much more likely before its final perfection to pass through degenerative changes than is that which is primary. It might be fairly anticipated from the method of attachment of an implanted tooth, through the formation of secondary structures, that this newly formed tissue would be first to be resorbed, and that the tooth would come away intact, but we do not find this the case—it is always through resorption of the tooth itself.

There has not yet been presented to the world a sufficiently authenticated instance of such secondary ankylosing tissue in the socket of an implanted or replanted tooth. In the *Dental Record* for April, 1901, is an able article by G. W. Watson, L.D.S., in which is represented an instance of what he believes to be bony ankylosis of a tooth; but it was not one that had been implanted or replanted. It was an instance of an extraction which brought away a portion of the socket with the tooth, and in which it was claimed there was no appearance of a pericementum. There was no secondary deposit, but simply an apparent absence of a limiting membrane. We know that certain sutures with the lapse of years become apparently obliterated; but these are articulations of absolutely homologous tissues, whereas, as has already been shown, cementum and dentin are only analogous. In the slides illustrated it does not appear to be demonstrated that there is any melting of the one tissue into the other, but the cuts are not sufficiently clear positively to demonstrate either the truth or the falsity of the claim to true ankylosis. It is quite conceivable that the membrane may have been almost infinitely attenuated, or even entirely lost, without true ankylosis resulting.

Mr. Storer Bennett, a very competent authority, in 1898 read before the British Odontological Society a paper in which he detailed several cases of what he claimed to be ankylosis of teeth, but the same objections that may be urged against the instance of Mr. Watson would appear to be applicable to those of Mr. Bennett. It does not appear that there was any union between the unlike cells of the bone and the cementum.

The union of the teeth of fishes to the jaw has been cited as an analogue and an ankylosis. There is no kind of articulation of the teeth of fishes to the jaw. They are absolute processes or prolongations of the jaw, and the bases of such teeth are homologous to the jaw, or are modified from it as bone is produced from cartilage, by the mere infiltration of lime salts, the basal structure being the same. In species in which they are not such processes no true ankylosis exists. Hence there is little of parallelism.

What, then, must be the method of attachment in cases of implantation and replantation? That which from the very circumstances of the case appears most obvious. There must be a new formation of membrane of pericemental and periosteal nature. Of course the possibility of the revivification of the old dead membrane is too absurd for serious consideration. Why should it be thought a strange thing that pericementum should be reformed, any more than that new bone should grow? We know that in wounds and injuries new periosteum is formed and becomes functional. There is quite as probably a genetic origin for pericementum as for periosteum. The plastic or organizable lymph which is the product of inflammation may as readily be transformed into membrane according to the type of that already in existence as into bone.

Admitting, then, what appears most probable, the formation of a new membrane of pericemental nature, what would naturally follow? The deposition of bone upon the periosteal surface through the formation of osteoblast cells, which will unite with the homologous bony walls and fill the existing cavity. Upon the pericemental surface of the membrane the condition is quite different. The cementum of the implanted tooth is without vitality, the lacunal cells being dead. It is scarcely possible that there can be any revivification of them, hence the cementum must remain in practically the same condition as the devitalized dentin. There is no instance, so far as we know, in which there has been any new

cemental growth in such cases. The new formation must be confined to the osseous tissue, and the new pericementum must closely invest the root; but the fibers of Sharpey may penetrate the cemental structure as they do the bone, and thus hold the tooth as firmly as though it had never been extracted. The new bone will so closely invest the root that the tooth may even appear more solidly fixed in its socket than before its removal. But the secondary formations which hold it in place will be more embryonal in their nature, and therefore more liable to degeneration, and any accident, any fortuitous condition which may induce a reversal of nutritive currents, would be likely to result in resorption, and the tooth would be lost in the very manner in which clinical experience has taught us is brought about its removal.

Discussion. *Dr. Thomas Fillebrown*, Boston: I consider the paper an excellent one, but it is along the same line that many writers of the present time follow—it deals largely in the realms of imagination. This, however, is not intended as a criticism, for such is now the tendency of all our educational institutions—they are seeking to make all professional or scientific studies classical. I heard a student say recently that in a year's course of physiology he had not learned a single fact, nor received anything that would be of value to him in practice. The professor dealt wholly in theories—what some one or other thought. Still, that is in one sense in the right direction, and Dr. Barrett's paper points that way. It emphasizes the fact that dentists should obtain a broader knowledge, so that they may be able to treat the medical aspects of the questions arising in their practice and in society discussions. I have long felt humiliated by the practice of so many dentists in calling in some physician to anesthetize their patients. It is wise to call a consultation in certain doubtful cases or where there is ground for serious apprehension, but the man who is not fitted to treat all the conditions that may arise before, during or after these operations falls far short of being a well educated practitioner.

The paper is a correct statement of present knowledge on the subject of pyorrhea, but there is too much of a tendency to make it an incomprehensible disease, to assume that it is far above practical observations. We are apt to forget that this disease does not occur in one case in ten thousand unless we first have a local irritant. Of course, whether the growth is luxuriant or not depends

upon the soil in which it is planted, and in this respect it may be a constitutional disease. A good constitution and healthy gums will resist all the bacteria of pyorrhea that can be put into any mouth, but where there is inflammation from local irritation, thickening the gum and offering a good chance for lodgment of foreign substances and fluids out of the circulation, germs have a splendid opportunity to work and they improve it.

Concerning the attachment of implanted teeth, I think Dr. Barrett's remarks are very good. The attaching membrane is no doubt pericementum. I think the essayist is right in regard to the appearance of an ankylosis, that it is a crowding in of the bony substance until the root is finally imbedded, a condition of gomphosis. I do not think the statement is correct that we never find a real assimilation between structures of a little different tissue. Cementum and dentin are certainly ankylosed thoroughly, and so are dentin and enamel. Now it is but a step between this and bone, and it seems possible to me that there may be a union between them. The teeth of fishes which were alluded to seem to be almost an illustration. The essayist says they are projections from the jaw bone, but are they not also tipped with cementum?

Dr. Barrett: They are calcified, but are not tipped with cementum in those cases to which I referred.

Dr. Fillebrown: I am not quite clear on the subject to-day, but I think Tomes states that some species of sharks and other fishes have enamelled teeth attached by complete ankylosis.

Wherever a new membrane is produced, in the way the paper indicates, although its function is the same as that of the old, the new tissue is never one in structure, nor is its function perfect, for whenever trials come this is the first part which fails. Any man who has had a limb broken, where there has been thorough ankylosis and where new tissue has formed, knows very well that whenever the weather changes or he has to do a little extra work this limb is the first thing to give warning.

Dr. James Truman, Philadelphia: When I hear a professor of pathology state that bone and cementum are not homologous I wonder whether my histological work was ever correct. As I understand these tissues, cementum and bone are homologous, and whenever an increase of the cemental tissue occurs it takes upon itself an approximation to the systemic arrangement of the lacunae

and canaliculi, exactly as in bone. Any one who has made sections of a tooth thus affected will find this to be true. How could it be otherwise? Are not the osteoblasts and cementoblasts analogically the same? Is there any practical difference between the functions of these cells in the formation of bone or cementum? It is stated that the cells in bone and cementum are unlike. This is another fallacy, for except perhaps in size they are exactly the same. The lacunae and canaliculi are exactly the same in cementum and bone, and any careful and skilled microscopist would not make such an error. I am opposed to such ideas being promulgated as statements of truth coming from this organization.

I have no sympathy with those who believe that pyorrhea is entirely constitutional. I recognize the fact, as a large majority of practitioners and investigators do, that it is a local disturbance, which has practically nothing to do with the gingivae. It belongs to the pericementum and is microbic in its origin. I believe there are two classes of pyorrhea—one that may come in early or middle life, and the other the senile pyorrhea, which is the result of consolidation of teeth in old age. The first is curable and the last not. We must make this distinction and treat the disease practically. The treatment is a matter of great interest and must be along philosophical lines if we wish to accomplish anything. It is often said that pyorrhea is not curable. What is meant by that? After a physician had dismissed a patient who had had typhoid fever would he say that the latter was not cured because he could not guarantee that the disease would not return again at some future time? When pyorrhea, notwithstanding the constitutional conditions which may have been present, has been cured, it is very possible that the disease may return at some time. For years I have had this matter in charge at our clinic, and with rheumatic and gouty subjects, under unfavorable constitutional conditions, I have never hesitated to treat the cases locally, and in the majority of instances have cured them. It is curable by proper systematic treatment. If authors and essayists would go less into the etiology and more into the practical treatment of the disease their labors would be far more satisfactory.

Dr. S. H. Guilford, Philadelphia: When a tooth is implanted in a socket—in an artificially made alveolus—one is usually selected that is surrounded with pericementum, and in the earlier days

implantation was not attempted unless the root was in that condition. When it was placed in the socket and held there for a certain time it became firm. Then the question arose, "How is it possible for a foreign substance to become firm under such conditions?" Different theories were advanced, and the most plausible one was, that a change takes place whereby the pericementum is removed and replaced by bony structure; in the same way, for instance, as the change which takes place in sponge-grafting. When we have a wound or lesion in the cheek a sterilized sponge is placed in the hole and properly protected, and we find that it is gradually removed and new tissue formed, so that in time normal tissue takes the place of the sponge and the space is filled up. Before this method was adopted an ugly cicatrix was formed when such an opening was closed, but under the new procedure it is found that the new tissue formed presents a much better appearance. So in implantation, just so soon as the tooth is placed in the artificial socket a certain amount of irritation or stimulation takes place, the bone cells immediately begin to form new bone, and this action continues until it comes in contact with the naked tooth or with the cementum. The pericementum is gradually resorbed and carried away and this tissue is formed in its place, so that when the tooth becomes firm it is apparently in direct contact with the bony tissue. This is seemingly proven by the fact that an implanted tooth gives forth a sound different from that of any other tooth when it is tapped with an instrument, showing that in the one case there is an elastic membrane surrounding the tooth and that in the other there is not. Now, in the course of time the implanted tooth becomes loose, and when removed it is found that the root, cementum as well as dentin, has been extensively resorbed. In other words, nature has tolerated the tooth for a time just as she might some other foreign substance, and has then set up a destructive process by which it has been lost. Briefly, nature forms an attachment to support the new tooth for a time, but after awhile she sets up an entirely different process and the tooth drops out.

Dr. G. V. Black, Chicago: I wish to speak concerning the manner of attachment in implantation. First as regards bone and cementum—in fishes teeth are attached to the bone, but in none of the higher animals is this the case, nor do we find cementum and bone becoming united. That is the important factor in considering

the lack of homology between these tissues. Cementum unites with cementum whenever the roots of the teeth come in contact. I had supposed that the attachment of implanted teeth was understood. There is a certain form of repair that always goes on when cementum is injured or absorbed and again repaired, which occurs very frequently, and a careful examination of sections of a few old teeth will give good illustrations of it. An absorption of cementum, for instance, or an injury occurs. If the latter, a slight absorption will take place and new cementum will be built into the absorbed area—either built upon the cementum or laid down upon the dentin if the absorption has gone into the latter. When a tooth is implanted the absorptive cells, or the remaining portions of the pericementum, or the connective tissue in case all pericementum has been destroyed, coming in contact with that cementum first begins an absorption and removal. Then a new pericementum is attached in the regular way, which is by the formation of fibres and the laying down of cementum around the ends of same, so that they become attached. This is also true when we move teeth in regulating, the fibres are attached to the bone just as the periosteum is. The same thing occurs in implantation. This new pericementum is cicatricial to a degree, and it becomes exceedingly thin, which has led many to suppose that there is a bony attachment, but there is always a membrane between. It is exceedingly thin, and without proper section-cutting and careful microscopic examination we should never discover that there is any membrane present. Now, if the absorptive process occurs it will destroy the roots of the teeth, and this is what generally happens in the course of time, because these are very imperfect.

Dr. C. N. Peirce, Philadelphia: To satisfy myself that there was no bony attachment, and that the attachment was only through the thickening of the pericemental membrane, I felt that if I could cut a slot in the root of the tooth to be implanted I might more quickly get the attachment. So I implanted three teeth, cutting a slot clear through the middle of the roots a little more than a quarter of an inch long and as wide as it could be without disturbing the roots, extending it not quite to the apical foramen. I observed of course all the essential care previous to the implantation. I was surprised to see how quickly these teeth became firm in the sockets, but I was more surprised to note that the roots became absorbed in

two years instead of five. Two of the teeth are now out and the third one probably is, although I have not seen it. When they dropped out the whole end of each root was gone, leaving little more than the crown. The slot gave a greater opportunity for absorption than as if the root had been perfect, and the attachment, as I stated, was entirely through the soft tissue.

Dr. E. C. French, Eau Claire, Wis.: I notice that all these histologists have laid great stress upon the cementum. Would the absorption of the root take place more rapidly where the cementum was removed, or is it absolutely necessary to preserve the cementum intact in implantation? Would there be any union between the dentin and the surrounding tissue if the cementum were removed from the root?

Dr. C. L. Hungerford, Kansas City, Mo.: Every one should know that the cementum of the tooth develops from what we call the pericemental membrane. Bony structures develop from what we call the periosteum, and it is well recognized that infection between the periosteum and bone causes caries of the latter, and a destruction of the periosteum produces necrosis of the bone and a sloughing of the mass. If in the extraction of a tooth the pericemental membrane comes away so that there is no covering to the alveolar process, an abscess develops at that point and the cavity from which the tooth was extracted does not yield readily to treatment; in fact, weeks and months may pass before the overfolding edges of the periosteum come down and cover the whole. These facts being true, it necessarily follows that the union between an implanted or transplanted tooth and the alveolus cannot be of a true physiological character. Now, what other process does nature employ to tolerate foreign substances in the physical economy? She encysts them—she heaps up a mass of leucocytes around the portion when infection is taking place, in order to protect herself from that infection or from that foreign body, and she throws out an inflammatory exudate at that point which builds up a tissue that holds a foreign substance, like a bullet or an implanted tooth, mechanically in position. Now, in case the lymphatic system is healthy enough to take away the products of septicemia of a local character or the detrimental tissue, we find that the foreign body is tolerated for a considerable time, and in case a complete encystation takes place before infection occurs the implanted tooth may very

probably be held in its position throughout life. However, it would be held there mechanically as a result of its encystment, just as a lead bullet would be that was imbedded in the flesh. Nature attempts to get rid of that, to make an exfoliation, and in so doing she throws an envelope about it, but while it remains it is still a foreign body having no connection with the economy. This seems to be the only rational and physiological basis upon which we can explain why teeth are sometimes held in the mouth, why absorption frequently takes place at the apical portion of the root, and why occasionally these teeth are thrown off en masse within a few days or weeks. The idea of extracting a tooth and expecting the periosteum to come away with it, and thinking that that periosteum will again become alive when it is put back in the mouth, is utterly contrary to any physiological law. It cannot be accomplished. When we extract a tooth it is settled forever that the periosteal membrane is detached from it, for the membrane has a stronger attachment for the alveolar process than it has for the cementum, and it is left within the cavity of the alveolus when the tooth is taken out, except in cases of abscess when it is detached from both sides. From this point a retrograde process begins. The alveolus is torn down or absorbed, and from the other side the larger cells commence to build up bony tissue and eventually it becomes true periosteum.

Dr. Edmund Noyes, Chicago: Perhaps it is possible that a tooth may be removed from the mouth and be replanted so soon that it will be restored to its former healthy condition, and that both the pericementum and pulp will live. I will cite one case which is authenticated beyond a possibility of doubt. A little girl, eight or nine years old, while swinging struck her central incisor so hard against something that it was knocked out of her mouth onto the floor. She picked it up and thrust it into its socket immediately without assistance, saying nothing to anybody about what had happened, and the tooth remained in her mouth with the pulp alive until her death about thirty years afterward. There is no question about these facts, so I suggest that there is such a thing as the cure of such a wound in the same way that any other analogous wound might be healed, by the immediate union of the severed tissues. Probably the calcification of the root in this case was not completed when the accident occurred, and the wide open foramen made possible the reuniting of the pulp vessels.

Dr. E. A. Bogue, New York: I should like to have this case explained: A girl thirteen years old was sentenced to lose her bicuspids, and one of them was transplanted without unnecessary delay into the mouth of a woman about forty years old, and has now been there thirteen years. By what process is that tooth now held in position?

Dr. Black: I should say it was held there by the normal processes, as nearly as they could be made so.

Dr. Bogue: I had supposed that, but what are normal processes? Is there a circulation of blood between the lining membrane of the socket and the cementum, or is there simply a bony deposit and a thin membrane independent of the tooth? Dr. Hungerford's views explain more fully than is usually shown why both the root to be implanted and the socket should be thoroughly antisepticised.

Dr. Hungerford: I thought I had previously answered Dr. Bogue's question. I do not know how any one looking at the gum or the tooth from the outside can tell the method of its attachment. It might be screwed in from beneath. I stated how it was possible for a tooth to remain perfectly solid if there were no infection, but I do not believe it is held there by physiological processes. Dr. Noyes spoke about a tooth being knocked out and replanted and remaining alive for thirty years. I am absolutely positive that it did not remain alive, although it may have remained in position throughout life. It may not have been discolored, but the pulp was dead after the attachment was broken. Sometimes in sponge-grafting we find that the blood vessels will throw their exudate into the sponge and that new tissue will be built into it as a medium whereby the parts can be raised up from the underlying tissue. Dr. Pierce spoke of drilling a little hole through the root. That would of course give a pocket into which serum would seep, and having no chance to be absorbed the latter would immediately commence to decompose. An evolution of gas would take place, and it would be a considerable factor in the loss of that tooth. Dr. Pierce's procedure would give a much worse condition than if the tooth were round and smooth and so could come in contact with the blood vessels and tissues surrounding it.

Dr. J. S. Marshall, Washington: To corroborate Dr. Noyes' statement I will relate a case in my own practice. I was once unfortunate enough in attempting to extract a lower first molar to

grasp the second bicuspid in the upper portion of the jaws of the forceps, the accident being caused by the patient's uneasiness, and I extracted two teeth instead of one. The bicuspid was perfectly sound and I replaced it immediately. I watched that tooth for five years, and saw it last about two years ago, the accident having occurred about fifteen years before. When I tested the tooth with ice-water and cold water it gave the ordinary response of the living tooth, but to make the matter perfectly sure I used the galvanic current, which never failed in my hands in detecting the vitality of a living tooth, and I can say positively that the tooth was alive.

Dr. Barrett, closing discussion: It seems to me that Dr. Truman has confused homology and analogy, but they are quite distinct and differentiated. Bone and bone are homologous, but bone and cementum are not, although they may be analogous. Cementum and dentin are not homologous. The union of cementum with dentin has been alluded to, but there is no union of the two tissues. Both are laid down simultaneously, and there is a complete interlocking, which is one thing. You who have examined the tissues that remain see clearly the line of differentiation between each, where the one is interlocked with the other, and where the one is a sort of gomphosis into the other, but still the line of demarkation between them is plain.

SECTION V.—Continued.

Pathology in Dental Practice.

PAPER BY GEO. W. COOK, OF THE SECTION.

We have a number of ill-defined symptoms supposed to arise from the non-elimination of cellular excretory product or the non-oxidation of certain nitrogenous matter. They are called autoin-toxication. Primarily this conception was based upon the fact that all living plant and animal life excretes certain substances which are poisonous to the cell from which they come. The question naturally arises, where does this animal excretion originate? It is not taken in with food or drink, for if one took nothing but pure food, pure water and breathed only pure air, the excretion of the organs would contain more or less poisonous products. These poisons are not found in the normal tissues of the body. We know that in the presence of warmth and moisture proteid matter is broken up by the agency of bacteria into its ultimate simple molecule nitrates, nitrites, ammonia (NH_4) CO_2, water, and various inorganic elements, viz., S. Fi. Na. K. Mg. Ca., etc. It is also a well-established fact that during this process of splitting up the proteid molecule by bacteria, there are a number of intermediate products formed which are basic nitrogenous crystalline substances that are intensely poisonous. Such, for instance, are called ptomains, the formation of which always points to action of bacteria on proteid substance.

The study of protoplasmic chemistry shows that the cellular elements which compose the animal body are capable of acting chemically upon dead organic matter—first, by synthetically building up the simpler organic molecules into the more complex proteid molecule; second, by acting analytically, breaking up the higher complex proteid molecule. In physiology this latter force

is called oxidation. Each cell in the multicellular body may be considered as an individual unit capable of performing all the life functions of the body, viz., taking in food and oxygen and excreting CO_2 and nitrogenous waste products in the form of uric acid, xanthin, urea, etc. The nitrogen taken as food into the normal adult animal body should equal the nitrogen excreted in the form of xanthin, uric acid and urea.

In the chemical process of splitting up the proteid molecule of the cell there is formed a comparatively simple molecular constituent known as urea. This proteid molecule when split up in this way necessarily gives rise to the formation of a number of intermediate products which are looked upon as steps in the oxidation process; they are antecedents of the nitrogenous end product, urea. Among these might be mentioned certain of the amido compounds: Adenin (C_5H_5 Ny_4); hopyxanthin ($C_5H_4N_4O$); xanthin ($C_5H_4N_4O_2$); guanin, ($C_5H_5N_4O$) uric acid ($C_5H_4N_4O_3$), etc. These compounds, which were supposed to originate in the tissues either along with or as a precursor of urea and uric acid, are termed leucomains. This, however, is a very indefinite term. In fact, most of these crystalline nitrogenous substances correspond very closely in chemical composition to certain basic nitrogenous crystalline substances found in plants and known as alkaloids.

There is to be found such well-defined amido compound in the tissue of plants as the basic xanthin, also caffein and theobromin, the last two of which are classed as belonging to the so-called leucomain group. In the vegetable kingdom these compounds cannot be considered as transitory oxidation products, but as integral parts of the proteid molecule; so in the animal proteid molecule these may exist as a part of the molecule only to be split off by a certain chemical manipulation necessary for the excreted products. As for their being poisonous to the body, we can no more admit it than that caffein is poisonous to the coffee tree, or nicotin to the tobacco plant; for in both cases these alkaloids exist, not as pure xanthin or caffein, but in the proteid compound which renders them non-toxic to the plant or the individual in which they are found. But the idea is still prevalent that during the process of oxidation (by which term we mean the transformation of the complex proteid molecule as it exists in the living cell or the dead food material to a more simple compound eventually ending in urea, $C\ O_2$, water,

which is excreted from the body as such) certain of the supposed intermediate products are not further oxidized, but remain in the tissue and are capable of producing toxic symptoms. That proteid matter is excreted from the animal body in the form of urea is true, but we have little or no evidence that certain basic substances in dead proteid matter are intermediate oxidation products. It is well known that if urea be retained in the body toxic symptoms will be produced (uremia) and in such a case the term autointoxication might be applied. These remarks will call attention to the theories on which the idea of autointoxication was formerly based.

In this country Vaughan has written extensively on what he terms autogenous disease or disease arising from within without any external stimulus, in the form of bacteria or other agency. From the evidence at hand we must admit that there are, or at least could be, pathological conditions arising from within, due to the retention or non oxidation of the products of cell metabolism, just as we know that retention of urea or uric acid may give rise to pathological conditions and toxic symptoms. But from a study of biological pathology we cannot admit that these so-called autogenous symptoms are primary and independent of external disease stimuli. Under normal conditions the animal body as a whole is able to dispose of its own excretion through the bowels, kidneys and skin; likewise every cell is able to contribute its normal quota of excretory matter to the general avenues carrying off the waste products; but let any of these general avenues of excretion cease to do their work and toxic symptoms will soon develop. Going back still further, the individual cells may cease to excrete their dead matter and cause retention, which is followed by toxic symptoms. But the primary cause which so changes the chemical constituents of the individual cells that they no longer carry on their work in a normal way, or so changes the kidneys that they no longer excrete the normal amount of urea from the body, or produces poisonous decomposition products in the bowels, must come from without; some agency acting as a disease stimulus. This view must do away with the term autointoxication, or the autogenous disease as a primary pathological entity, and reduce such conditions to the plane of secondary conditions following the external disease stimulus.

This is well illustrated in rheumatic fever, which has long been looked upon as a form of autogenous disease due to the retention

or non-oxidation of certain nitrogenous cell products, viz., uric acid and some others of the xanthin basis. Admitting that certain of these do accumulate in the form of urates in the body during rheumatic fever, the primary exciting cause of it is now looked upon as a germ entering the tissues and so changing their chemical constituents that oxidation or what not cannot be carried on normally, which thus gives rise to the rheumatic pathology. Adami has demonstrated almost beyond doubt that pernicious anemia is secondary to external causes. This so-called tired feeling and common headache are due to bacterial causes.

All biologico-chemical investigations are forcing us to answer these questions in the affimative. We have many reasons for believing that many of the so-called autointoxications or autogenous diseases are due to a chemical change in the proteid molecule of the cell caused by a chemical change in the cell environment. This must necessarily bring about a change in metabolism, thus liberating the poisonous products of the cell. But where shall we look for the primary cause? In nature all organic matter is reduced to its primary elements by the agency of bacteria; that is, by the enzymotic or fermentative action. Also, on living or organic bodies certain bacteria find a food medium, and act in an enzymotic or fermentative way, giving rise to certain changes in the cell. This is well illustrated by the action of bacteria on the contents of the large bowel, forming indol, skatol, phenol and other substances, which if absorbed into the system may act as poisons.

It is a well-known fact that bacteria may and even do pass through the walls of the bowels and enter the general circulation. When such is the case there will necessarily be a change in the blood and lymph, which in time would act upon the cell, changing its activity. This is what Adami calls subinfection. So far as we know, we can trace all the so-called autointoxication to a primary subinfection from the bowel or respiratory tract. Bacteria may act at any place along the alimentary tract from the mouth to the lower bowel. If the condition of the mouth is not hygienic, or the food is not of the proper kind, the stomach or bowels cannot dispose of it at the right time, thus giving lodgment to various fermentative bacteria. They or their products are readily absorbed into the system, and either may give rise to poisonous symptoms or may change the chemistry of the blood lymph or the cells themselves,

also change non-pathogenic to pathogenic bacteria, which are generally looking for an entrance into the body either through the respiratory or gastro-intestinal epithelium, there finding favorable media in which to grow and carry out their further changes which are incompatible with the life of the host. This second condition is really a subinfection and explains the way in which all infectious disease, whether of a local or general character, may originate. It has been demonstrated experimentally that if the bowel is occluded in any way the bacterium coli communis soon passes through the epithelium and appears in the blood and tissues of various organs, such as liver, spleen and kidney. Pernicious anemia and cirrhosis of the liver have been attributed to subinfection.

It would be taking a long step backward to say that the cell is the entity of disease, especially of such as pyorrhea and many of the local lesions of the oral cavity. When we consider that a disease process is the result of a series of factors which are of unequal value, we are then forced to say that the essence of the disease is not in the cell (Virchow), nor is it time or place (Pettinkofer), nor that a bacterium is the true and sufficient cause of disease (Koch); but all of these are factors of unequal value. With these facts before us we can no longer say pyorrhea alveolaris is constitutional any more than that an alveolar abscess is constitutional—both of which are to be dealt with as local microbiological affections, the same as rheumatism, catarrh, influenza, pneumonia and diphtheria. The cure of this disease, as of all other infectious diseases, must be to remove the predisposition of the individual, under which come the phenomena of inherited and acquired immunity and predisposition to this disease. We know by the action of certain physical or chemical agents that it is possible to arouse by local treatment, to a temporarily exalted activity, the natural protective forces residing in the local cells, and by constitutional treatment to so act upon the wandering cells and the active chemical bodies of the tissues and fluids as to lessen the predisposition of the local cells to the external stimuli (bacterial). It is not a question of one unknown quantity, but three variable quantities with which we have to deal. Predisposition may in some cases manifest itself to a point of susceptibility. This group of cells coming in contact with a facultative parasitic and saprophytic microorganism, a disease process is established. There is to be found a similar biological phenomenon in the tubercule bacillus.

In studying any pathological process in the oral cavity, pleomorphism of microorganisms is an important factor, and if the investigation along biological sciences is followed out in disease processes of the oral cavity, as has been done in other fields, it will make a great epoch. The results of some investigations of mine bearing upon this subject have brought to light several very interesting problems which have thus far never been discussed in this connection, for instance, the changing of the osmotic pressure of saliva. I have been able to change the pathogenic microorganism to a non-pathogenic state by the use of different saliva. The pathogenic properties of microorganisms in the saliva depend upon the nutritive value; therefore it is purely the chemical properties of saliva that manifest themselves in the changed conditions of microorganisms, both morphologically and pathologically. In this connection I will relate some tabulated observations in persons whose gastro-intestinal disturbance was the predisposing cause of local infection.

Vincent described what he called the bacillus fusiformis (which is quite common in the human mouth), and called attention to certain pathological processes on the oral mucous membrane. I have had opportunity of studying the vital phenomena of this microorganism. It seems to live in the oral cavity as a saprophyte until intestinal disarrangement appears, when, if the trouble is but slight, this bacillus will set up only a passive inflammatory process. Should the intestinal disorder increase, the local ulceration also increases. It is only by a bacteriological examination that it can be determined from some of the syphilitic lesions in the mouth. I am not as yet prepared to say whether or not this germ is always present in the oral cavity, but if it is, there are times when there are but few.

One of the most interesting phenomena I will mention is the rapid increase in irritating properties and in numbers of the germs. When mercury is administered in any great quantity and for some length of time, mucous patches appear on the oral mucous membrane, sometimes involving one or both tonsils and forming a pseudo-membranous exudate which might easily be mistaken for a diphtheritic membrane. In some cases the breath becomes more or less fetid; the parts affected are slightly painful to the touch; and in two cases there was glandular enlargement. A rise of temperature is sometimes present where a considerable area of mucous membrane is involved.

The points I wish to bring out are, that the germ may be considered as one of the oral cavity, for the reason that so soon as any gastro-intestinal trouble is set up mucous patches may appear on the oral mucous membrane or tonsil, possibly both, in which it is the exciting cause. I believe as Lesner does, that in mercurial stomatitis it becomes a factor of considerable importance; by local treatment the local affections disappear, but in a few days they will return unless the predisposing cause has been removed. How true is this in pyorrhea alveolaris? There are at least six other affections of the oral mucous membrane which are due to the action of microorganisms, but only where there is a predisposing cause in the body fluids.

Marmorek, Kolle, Widal and Bezancon have all observed the difference between streptococci grown in the mouths of healthy persons and those grown under other circumstances. Those grown in the mouth are short chained and will not set up a disease process as do those grown in bouillon. I grew the streptococcus brevis in saliva of a person who was suffering from nervous prostration after having undergone a surgical operation. I followed this up in the following cases: Two persons suffering from a slight gastro-intestinal affection; one individual suffering with a valvular trouble of the heart; five with rheumatic affection of the joints; one with carcinoma of the stomach. The virulence of the streptococci would increase when the growth was continued for any length of time in the saliva of these individuals. However, if the growth be returned to the saliva of healthy persons the short chains will again appear and the pathogenic properties will become noticeably less.

In six rheumatic persons I studied the bacteria of the tonsils and found that three of them had a diplococcus described by F. Meyer. All of these cases had pyorrhea alveolaris, and showed the characteristic bacteriological finding. This diplococcus found in the tonsil in some cases should be called a streptococcus. The length of the chains seem to depend upon the condition of the gastro-intestinal tract. When the bowels become constipated it manifests itself in the length of the chains taking on a streptococcus form. When saline cathartics are given internally, or if the individual takes sodium salicylate, the diplococcus form again appears and finally disappears from the tonsillar mucus. Clinicians have observed such conditions after injection of antitoxin. The saliva is a salt solution

containing chiefly Na. K. and Mg. ions, and as the irritability of protoplasm depends upon the proper qualitative and quantitative relation of these ions, any change in the constitution of an individual will change the ions in the saliva, thus affecting the irritability of the protoplasm of the microorganisms. The pathologist of the oral cavity has had and always will have difficulty in establishing disease processes on anything like an accurate basis as mathematics, for the substance is too complex for the use of mathematical rules.

In conclusion, I wish to emphasize the point that there is a marked line between a predisposing and an exciting cause of disease.

Discussion. *Dr. W. H. Whitslar*, Cleveland: This is an admirable paper of Dr. Cook's, and I should feel better prepared to discuss it if I had had an opportunity to read same beforehand. It is due to all concerned that a reasonable time be allowed for the discussers to digest the material at hand before papers of this technical character are read in the meeting. Dr. Cook states that disease does not reside in the cell, the circulatory fluids, or bacteria alone, but that it may be a correlation of these forces. Upon these elements are dependent the principles of chemistry and physics interchangeably. Osmotic forces are spoken of as having much influence in rendering fluids suitable or unsuitable media for the proliferation of bacteria. This indicates the changes to which saliva is subjected. Saliva is one of the recrementitious fluids of the body, that is, it is formed in the body and excreted naturally, but if not expelled it is resorbed. The liver is one of the secretory organs of the alimentary canal and secretes a fluid called gall. If this is not properly excreted or expelled from the body, osmotic pressure causes a diffusion of same, and its coloring pigments are shown in the skin and the coloration which we term jaundice. The principle is the same with the salivary glands, and as Dr. Michaels has demonstrated, the saliva carries with it in certain cases biliary pigments as well as other substances. Now, we realize that saliva thus contaminated may become a suitable medium in which bacteria proliferate and become the exciting cause of autogenous diseases. The peculiar condition of the saliva may lead to a subinfection, as the essayist states, but direct or autoinfections are more disastrous.

Now upon what do all these processes depend? First, a correlation of all things in nature, and second, the body itself, and its

nervous system principally, upon which coordination of all its powers depend. In the present age we should become better physiologists and pathologists, so that we may recognize disease. When we delve into the knowledge of the chemistry and anatomy of physiological and pathological processes which come as the result of injury to or disease of the nervous system, then we are getting at the root of all disease. We may obliterate portions of the brain, of the spinal column, and of other parts of the body, but when we obliterate the nerve influences, the neuro-dynamic forces which are constantly playing back and forth, death results. In the study of the etiology of dental caries we must go back of the normal functions of the body and note the pathologic conditions which result from interference with the neuro-dynamic forces which are variable. In so doing we find the forces which enter into the production of saliva, and that the materials residing in the circulatory fluids poison the glands, as is evidenced by the saliva in the mouth. The result is that there is a coordination with the bacteria in the mouth towards the production of dental caries.

SECTION V.—Continued.

Evolution of the Premolars.

PAPER BY A. H. THOMPSON, OF THE SECTION.

At the last meeting of the National the writer had the honor of presenting a study of the evolution of the complex molars from the simple cone, in which the process of the formation of the many varied and complex types of mammalian molar crowns, by the modification and multiplication of the simple reptilian cone, was described. As Osborn says, "The primitive form of the mammalian molar was the single cone, to which all other cusps have been successively added by the slow process of transformation of the single-fanged, reptilian, conical tooth." This primitive, simple cone is called the *protocone*. To this cone was added, by cusp duplication, first, upon the anterior or mesial side, the *paracone;* then one upon the distal side, the *metacone*. This made a crown with three cones in a row, called the *triconodont* form. Then these three cones shifted their positions so as to form a triangular crown, the protocone moving to the lingual side and the paracone and the metacone to the buccal side of the crown, thus forming the *trigon* of the upper molar. To this trigon was subsequently added, disto-lingually, the heel or *talon*, carrying the fourth cone or *hypocone*. This constituted the quadritubercular molar of the upper jaw. In the lower jaw the position of the three cones was reversed, the single *protoconid* moving to the buccal side and the others to the lingual, so that the primitive triangles passed each other with a shear-like motion. Then later the *talonid* was developed to support the tubercles which struck into the valley of the opposite trigon of the upper molar in the evolution of a more complicated masticating armature.

The history of the evolution of the premolars, however, is quite a different story, for the process of arrangement of the primary cones in the course of their differentiation and elaboration varies greatly from that of the true molars. The evolution of the latter is quite simple and the process is readily grasped; but not so with the premolars, in which it is more complicated and not so well understood. As Prof. W. B. Scott says, "The premolars have quite a different history, even when these teeth have become completely molariform; as the elements which correspond in function and position to those of the molars are not homologous with them, the key to these homologies being given by the position of the protocone. The premolars do not display quite the same degree of constancy in the order of succession of their component cusps as do the molars. * * * The primitive form of the premolar is the simple cone, implanted by a single fang, which is still preserved by several existing genera and which obviously corresponds to the protocone of the molars. In early geological times, however, this was complicated in almost every genus by the addition of a second cusp upon the inner side of the protocone, which may be called the *deuterocone*. (Fig. 1.) This bicuspid tooth represents a pattern from which all the premolar types of the higher mammalia may be simply and naturally derived by the continued addition of new parts which in many groups reach the same or even a greater degree of complication than the true molars. Furthermore, this tooth brings out clearly the important fact that while in the molars the protocone has shifted to the internal or lingual side of the crown (above), in the premolars it remains upon the external or buccal side of the crown (A. Fig. 1), just as in the inferior molars. From this it follows that the deuterocone has no exact homologue in the molar crown, though functionally and in position it corresponds to the protocone of the molar."

This important divergence makes a distinct difference between the premolar and the true molar above which must be taken into account. The construction of the two is essentially different—the protocone of the molar moving to the lingual, and the protocone of the premolar moving to the buccal side of the crown, and then the deuterocone is essentially a premolar cone, not being developed as such in the molar scheme. These differences mark off the premolars from the true molars as being very divergent as to the plan

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of the arrangement of the cones and the process of the evolution of their crowns which is much more complicated and confusing in the premolars.

The extensive series of the premolars in many mammals shows in early geological forms that these teeth have become progressively complicated from the posterior to the anterior—the reverse is the rule in the molars. Scott says that "In these early mammals the anterior premolar teeth are for the most part as yet perfectly simple, consisting of the protocone only. In some genera the second and third have merely the addition of the deuterocone. In the true molars new complications very generally make their appearance upon the first of the series and then successively upon the second and third; but in the premolars the fourth is the first to present new features and then these advance to the anterior premolars"—the first never being so complicated as the others.

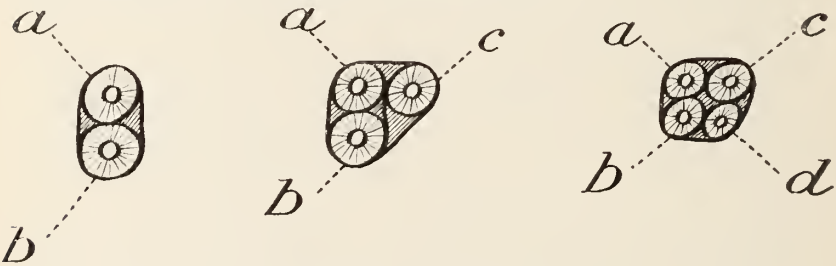

Fig. 1.—Scheme of the evolution of the upper premolars. *a.* Protocone. *b.* Deuterocone. *c.* Tritocone. *d.* Tetartocone.

The addition of the lingual cusp, the deuterocone, to the external or protocone is that type of the premolars with which we are most familiar in man as the bicuspids. This simple type is very primitive and follows next after the single conicle or monocuspid type of this tooth. Dr. Harrison Allen years ago called attention to the process of the evolution of this simple type. He said, "An incisor and cuspid tooth are composed respectively of one cusp and a small cingule; a bicuspid, of a cusp and a large cingule which participates in forming the triturating surface; a molar, of three cusps and a cingule, etc. * * * A true development occurs from the cuspid and incisor series toward the molars, so that the cingule of the cuspid becomes the cusp of the bicuspid. * * * In describing a normal upper bicuspid we would state that its single buccal cusp is the 'cuspid' cusp and that its palatal is its true

'bicuspid' cusp—i. e., the cusp which creates a bicuspid tooth out of a cuspid." In this remarkable insight into the principles of tooth evolution Prof. Allen anticipated the later elaborate researches and discoveries of Cope, Osborn and Scott which have done so much to illuminate this wonderful study.

From the primitive bicuspid type the premolars were further elaborated by the addition of other cones, so as to make the crowns more complicated, as it were, to be in harmony with the molars in the same denture. Scott says further, "The second stage of premolar development consists in the addition of a second external cusp posterior to the protocone, which I have called the *tritocone* and which corresponds to the paracone of the molar; but it cannot be regarded as homologous with that element because its position with reference to the protocone is entirely different. (C. Fig. 1.) This stage of development imitates very closely the trigonodont molar and very frequently this type of premolar displays the intermediate conules, either anterior or posterior or both. In position these conules correspond to the proto- and metaconules of the molars but are obviously not in harmony with them. * * * This trigonodont stage of the upper fourth premolar is very widely distributed in the middle and upper Eocene. * * * With some special modifications it persists to the present in the sectorial of the carnivora, in many insectivora and in some ungulates. * * * The first step in the conversion of the premolars to the molar pattern is given by the addition of the fourth main element at the posterior internal angle of the crown, the *tetartocone*, which corresponds to the hypocone of the molar. (D. Fig. 1.) * * *

"So far as I have been able to observe, the development of the upper premolar appears to be quite constant, * * but the development of the inferior seems to be somewhat less regular and constant. As with the upper jaw, the complication begins with the fourth premolar and advances anteriorly, but it is worthy of notice that in many forms the complication of the inferior premolars begins earlier and advances further than in the case of the superior teeth. As before the initial point must be taken as a simple conical cusp, the protoconid. (A. Fig. 2). Most of the existing unguiculates, as well as some recent and many extinct ungulates, retain a few teeth which depart but little from this type. In many forms the only addition to the protoconid consists of a small posterior buccal

cusp, as if the equivalent of the metaconid of the molar. (B. Fig. 2.) In many of the carnivora a secondary posterior cusp is added, * * frequently also an anterior buccal cusp strictly conformable to the paraconid of the molars (C. Fig. 2), and a stage like that of the triconodont molars is attained, consisting of elements which we may regard as homologous with the three primary cusps of the molars. There is, however, a great difference as to the regularity with which the para- and metaconids are present and in the order of their succession; one or the other may never appear at all. * * * In the premolars, when a cusp occurs occupying the position taken by the metaconid in the molars, it cannot be regarded as homologous with that element, but rather with the deuterocone of the upper premolars, and may consequently be called the deuteroconid.

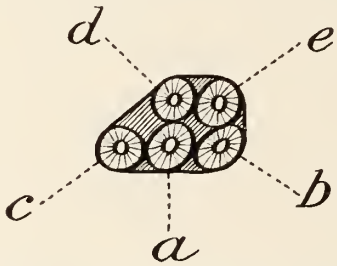

Fig. 2.—Scheme of the evolution of the lower premolars. *a.* Protoconid. *b.* Metaconid. *c.* Paraconid. *d.* Deuteroconid. *e.* Tetartoconid.

(D. Fig. 2.) The latter also varies as to the relative time of its appearance; sometimes it is the only element present in addition to the protoconid, or it may be developed after either the para- or metaconid, or it may appear last of all and in many cases it is altogether absent; yet when it does appear its homologies are perfectly obvious.

"A fifth element is sometimes added to the premolar crown below, posterior to the protoconid and interior to the metaconid, thus occupying the position of the entoconid of the molars. (E. Fig. 2.) Clearly, however, it cannot be homologous with that element, its place in reference to the metaconid being entirely different. Its homologies are rather with the tetartocone of the upper premolars, (D. Fig. 1.) * * as the primary cusp or protocone remains upon the external side of both the upper and lower premolars. The tetartoconid is usually the last cusp to make its

appearance upon the crown of the inferior premolar, but there are exceptions to this rule. For instance, in one fossil form the lower fourth premolar consists of a very large protoconid and a large but lower heel or talonid, made up of the metaconid upon the outside and the tetartoconid upon the inside, neither the para- nor the deuteroconid being present."

These very unusual complications and variations make the study of the evolution of the premolars very difficult and confusing and take it far from the simplicity that characterizes the pathway of the evolution of the true molars. The protoconid seems to be the only one constant element, and not even the deuteroconid, the especial premolar element, and which naturally should occur in the next grade of frequency, can be relied upon. This characteristic element should be more permanent. Indeed, the subsequently added elements show scarcely less variability and inconstancy than the deuteroconid, which is very unusual. In the molar system the latest added elements are the most variable and the first to fall in the process of retrograde evolution, but in the premolars the first added element, the deuterocone, seem to be quite as variable and inconstant as those which are added later. The hypoconulid of the lower second molar and the hypocone of the upper second and third molars, for instance, are inconstant and variable by reason of being added latest and are therefore the first to fall in retrogressive evolution. With the premolars, however, the first added to the primary element may fall and the later added elements persist, which is quite unusual and unique in tooth evolution.

As Scott says again, "The foregoing survey of the steps of premolar development in those mammalian groups which enable us to follow it out show very clearly that the premolars follow an order of differentiation quite at variance with that attributed to the molars, even when the final results are the same. In the upper fourth premolar the order of succession of the cusps is remarkably constant, while in the other superior premolars and in all of the lowers the order is very much less regular although their homologies are clearly apparent."

While in many lower mammals the premolars are much elaborated, notably so in the ungulates and the plant-eaters, in the primates they are very simple and comparatively undeveloped, presenting the simple bicuspid type which consists only of the proto-

cone and the deuterocone. Scott says, "In the higher primates the premolar type is that of the human bicuspid, the crown consisting of two elements only, the protocone and deuterocone. (A. B. Fig. 1.) * * * In *anaptomorphus* (a fossil lemur) the lower premolars are simple, having a high, acute and recurved protocone with a rudimentary metaconid on a heel, * * but the upper ones have added a deuterocone which is particularly well developed in the fourth premolar. * * * Other fossil forms have four premolars also, but the anterior are small and simply conical, and the posterior two in each jaw have added new elements. In the upper jaw the crowns of the third and fourth are transversely placed, consisting of a trenchant, pyramidal protocone and a smaller but well developed deuterocone. In the lower jaw the third premolar has in addition to the protoconid only a rudimentary metaconid forming an inconspicuous heel. In the fourth premolar this heel is better developed, and on or at the side of the protoconid appears a small deuteroconid. In the existing representatives of the primates there is not much advance upon the degree of premolar complication found among the early Eocene forms." In fact, down through the long list of primates to man the form of the premolars is extremely simple and undifferentiated—the bicuspid type with little variation, except as to the prominence of the lingual cusp or deuterocone, is found throughout the entire line. In man the second lower bicuspid with the three tubercles is probably a reversion to the form when the deuteroconid and tetartoconid were fused and then divided. They seem to become separated in the higher races, but the lingual cusp is a continuous crescent in the primates and the lower races of man.

In the *insectivora* there is considerable elaboration of the premolars, even in fossil forms. The tritocone and the tetartocone are added above so as to simulate a molariform type that is highly specialized. In some genera the fourth premolar is more complicated than the true molars. In the *carnivora* (Scott) "The premolars acquire a very great degree of complication. In the *pinnipedia* the molars and premolars are very much alike, although this is due rather to the simplification of the molars than to any complexity of the premolars. They may be mere conical bodies, as in the *otariidae* and hooded seals, with a crown consisting of a simple cusp and implanted by a single fang; or as in the typ-

ical *phocidae*, where both molars and premolars are of one type, characterized by the suppression of the internal cusps and the addition of the sharp, low cusps on the anterior and posterior edges of the principal cone, which appear to represent the paracone in the upper molars and the protocone of the premolars of both jaws and the lower molars. The lower premolars of the carnivora are always more or less simple and trenchant, though they vary some in respect to thickness, height, acuteness, etc. They generally display the metaconid, and sometimes an additional basal cusp is formed by the elevation of the cingulum posterior to the metaconid. The paraconid is seldom developed but occurs in many of the viverrines.

"The *perissodactyla* are characterized by a very high degree of premolar differentiation. In all of the existing families these teeth have assumed the molar pattern, a tendency which very early becomes apparent in the ancestral forms and even in the extinct phyla." In the early fossil forms these teeth are of course much more simple, but they soon tend toward the complicated pattern of the molars so that the resemblance is very early made apparent. This is shown in the third and fourth premolars which "resemble the molars on the buccal side, having proto- and tritocones of nearly equal size, and the anterior pillars largely developed. Internally, however, there is but one cusp, the deuterocone, which sends out two crests toward the outer wall of the tooth. These crests appear to be developed from conules analogous to those of the molars with either the deutero- or the tritocone. The inferior premolars vary somewhat in different species. The third is very simple, having only a small metaconid added to the compressed and acute protoconid. The fourth has also two internal cusps, the deuteroconid in front and the tetartoconid behind. The number of cusps present is thus the same as in the molars, but the small size of the internal elements and the low heel give to the crown a very different appearance." This structure of the premolars is largely typical of many of the fossil progenitors of this group and even the types of the recent forms are but little modified except in the direction of further elaboration by more intricate foldings of the crests and ridges, which is characteristic of contemporary selenodonts.

"The *artiodactyla* group never attains the high degree of homodontism that is characteristic of all the later perissiodactyls, and yet it displays a considerable amount of premolar complication, and

one which is brought about in very different ways in different groups of the order. In the most primitive type the premolars are quite simple, the third and fourth upper premolars having as a rule one external and one internal cusp, the protocone and the deuterocone respectively. The lower premolars are also extremely simple, being elongated in the antero-posterior direction, and have compressed trenchant crowns which are made up of the large protoconid with minute but distinct and sharp para- and metaconids." From this early type the premolars were modified and elaborated by the extension of the crests and the modification of the constituent cones. There is a somewhat regular development in the group except in some of the *procamelus*, "which appear to depart from the typical order, in that the inner crescent of the second and third premolars is formed, not by the extension of a single element, the deuterocone, but by the coalescence of two; but the posterior part of the crescent is probably homologous with the deuterocone."

This general study of the evolution of the premolars necessarily leaves much unsaid, but will perhaps in a degree serve to show something of what has been accomplished in the direction of unraveling the complicated process, which is unique in its difficulties in the field of tooth evolution.

SECTION V.—Continued.

Empyema of the Maxillary Sinus—Diagnosis and Surgical Treatment.

PAPER BY W. H. G. LOGAN, OF THE SECTION.

Empyema of the maxillary sinus is the result of an inflammatory condition of the mucous membrane which lines this sinus. While the cause of this inflammation which results in suppuration will, as as a rule, be the result of an abscess forming near some one external

FIG. 1—Showing close relation of apex of lingual and buccal roots with floor of antrum, no bone intervening between lingual root and antrum.

surface of the antrum, the floor when in close relation to the apex of the root of any tooth is in danger of septic penetration, or the presence of an inflammation which may cause empyema. The writer does not believe that we have direct penetration of septic matter from the dental aveolar abscesses so often as has been claimed, yet that it does occur at times from this source cannot be denied, as it is proven by cut No. 1. Ulceration upon the mucous

membrane of the nasal fossa at times so disturbs the normal condition of the mucous membrane lining the antrum that suppuration occurs.

In the diagnosis of empyema of the maxillary sinus we find a sensation of fullness in the part; dull pain throughout the region bounded by the eye above, the teeth below, the ear posteriorly, and the nose anteriorly; a rise of temperature of about one degree for a few hours during each day, and frequently headaches which seem to be caused by neuralgia as the result of a diseased condition of the infraorbital nerve. To differentiate neuroma of the nerve

FIG. 2 (after Cryer)—Shows antrum high above supposed normal position.

from local irritation press upon the branch at the point where it comes through the infraorbital foramen. If a pronounced diseased condition of the nerve exists, a paroxysm of pain of great intensity but of short duration will result, while if the cause of the neuralgia over the branch is local or remote and the normal condition of the nerves not disturbed, the result of the pressure will not cause pain of consequence. The passage of pus from the diseased antrum into the nasal passage through the natural opening, which is located in the middle meatus, can be noticed by the patients if you direct them to lie upon the diseased side for six to eight hours, and having the head inclined a little forward will cause the escaping secretions to pass anteriorly enough for proper examination.

Patients frequently complain of droppings from the nasal passage into the throat for the first few hours after rising. The presence of a number of the enumerated symptoms, an examination of the teeth present in that maxillary to discover if any contain putrescent pulps, and the illumination of the oral cavity with an electric light, which will give a darkened territory extending beyond the borders of the antrum if it be diseased, will produce a finished diagnosis.

In the surgical treatment of empyema of the maxillary sinus we find a wide range of opinion as to the proper point at which to make the opening through which we are to treat the infected area.

Fig. 3 (after Cryer)—Showing same as Fig. 2.

Many consider it wise to open through the cuspid fossa and there inject the solutions to irrigate the antrum. An opening here may at times give good results if the case is of short standing, but must not be looked upon with favor because this location is too high for good drainage. With the idea of gaining perfect drainage, many operators claim that the best practice is to extract either the superior second bicuspid or the first molar and drill or chisel through the intervening bone into the antrum, maintaining the opening with a gold or platinum tube, which extends a trifle above the floor and is held stationary by cementing a band, which has been previously soldered to the tube, on the tooth.

In entering opposition to this mode of operation the essayist is well aware that he will be criticised by the majority of oral and

general surgeons. His reasons for believing that this form of surgical treatment should be usually abandoned are: 1. The frequent and needless loss of the tooth. 2. The uncertainty of gaining access to the lowest point of the floor. 3. The liability of missing the sinus entirely and entering the nasal fossa, as is proven by cuts No. 2 and 3. 4. The removal of the diseased hard and soft tissue is accomplished with more difficulty, and is made improbable in many cases if the opening is not greater in size than the space occupied by one tooth. 5. An ocular examination of the sinus cannot be made through the opening of ordinary size used for the reception of tube.

FIG. 4.

The ideal operation to control empyema of the maxillary sinus should embrace the following three points: 1. An opening large enough to allow of an ocular examination. 2. The position of this opening such that it will afford the best natural drainage and not demand extraction of any tooth. 3. The employment of some non-irritating method or device to maintain the original opening until a normal condition of the diseased part is obtained.

These three points can be embodied in one operation, if it be performed as follows: Make an incision through the soft tissue, extending from a point marked by the apex of the upper second bicuspid to a like location upon the upper second molar, and reflect the soft tissue upwards, exposing the bone. Now make an opening through the external wall of antrum with a bone drill in the

dental engine. The location of this opening should be just above the buccal roots of the first molar. With a silver probe you may now determine the form, size and location of the lowest point in the antrum. The next step is to enlarge the buccal opening through the bone so that you will be on a level with the floor. In the control of those cases where the roots extend close to the floor, make your buccal opening between the roots of the teeth, if they be in position and have live pulps, and extend it until a perfect ocular examination of the sinus is possible. With a large curet remove all diseased hard or soft tissue, syringe out the part and pack with borated gauze, which is left in position for twenty-four hours. To

Fig. 5.

maintain the opening make a gutta-percha plug, as shown in cuts Nos. 4 and 5, with a flange on its superior surface so that cheek will hold it in position, and a groove on its anterior surface to allow for the escape of secretions. The parts should be irrigated daily until cured, employing carbolic acid and nitrate of silver solutions. Have the patient lean the head forward while irrigating the part, carry the fluid with a one or two ounce syringe, force the solution from the artificial opening through the natural opening into the nose, and continue the irrigation until the fluid escaping from the nostril upon the face is free from discoloration.

The writer does not believe it best to rely upon gauze to maintain the opening or to combat the disease, because it becomes putres-

cent so quickly, and its frequent removal disturbs the forming granulations.

To control those cases where the gutta-percha plug will not stay in place, I call your attention to cut No. 6, which shows a removable band about the crown of an adjacent tooth, having soldered upon it a bar which extends into the plug, holding it securely in position. Have the band just tight enough about the tooth that it will not come away of its own accord. The plug and its support can be easily removed when you wish to irrigate the part. As the diseased condition improves within the antrum reduce the size of

Fig. 6,

plug, but for fear of recurrence do not remove it entirely until a few days after the normal state has been reached. After a healthy condition has been maintained for a week you may dispense with the plug, but keep up the irrigating every two or three days as the case demands until the artificial opening closes. In the medical treatment of these cases of long standing the employment of various solutions and powders is indicated, for no one line of treatment will cure them all, but if you make the artificial opening very large and low enough for perfect drainage, keeping ever in mind that the opening must be maintained and the part irrigated with perfect regularity, success will crown your efforts.

Discussion. *Dr. G. V. I. Brown*, Milwaukee: I think the

etiology given by Dr. Logan is faultless, and his statement that we may infrequently have antral trouble from the roots of a diseased tooth is correct. He did not explain why this does not occur oftener, so I will attempt to. Even where the roots of the teeth come quite up to the floor of the antrum, as was shown in one of the slides, I believe abscesses at the ends of these teeth often occur without empyema, because the wall of lymph which surrounds the formation of pus in the alveolar wall prevents in a measure the passage of that pus in various directions. Frequently in such cases we find that the lining of the antrum and the tissue there is pushed up, and that upon the inside of the antral cavity the mucous membrane is often in a fairly healthy condition, until we insist on puncturing it and causing trouble. I have learned not to treat antrums until I am reasonably sure that an abscess or empyema or some condition which needs treatment exists. Often when we are treating an abscessed molar we find that the probe passes out through the end of the root and some little distance beyond, and we naturally conclude that the antrum requires treatment. I used to penetrate the antrum in such cases, and treat it in order to be sure, but I do not do so any more, because I have found that the mere fact of the probe going some distance beyond the end of the root does not indicate that it passes into the antrum. Usually everything will turn out well if we simply give the root a thorough treatment.

Now, when we must enter the antrum to treat it, and when the diagnostic symptoms are as stated in this paper, we might note one or two points. For instance, I think the essayist has been more definite than it is well to be in his description of what would be indicated by a tenderness above the areas immediately over the nerve. He speaks positively, as if distinguishing neuritis, for instance, from an irritation which would come from the antrum. So long as we have the neuritis it does not make much difference what the irritation is. We may press over or near the foramen where the pulp issues and find that it is tender and that we have there those symptoms of neuritis. As the paper reads, we should be misled into thinking that no antral case existed. We may have neuritis as the result of irritation in the antrum or elsewhere, and hyperesthesia may result from some nerve irritation and may or may not be in the antrum. There is one symptom which occasionally

causes a little difficulty in diagnosis on the part of the oculist when he is not familiar with antral affections—I refer to pressure on the eyeball, causing its protrusion.

There is often pus in the antrum, and the rhinologist is constantly dealing with antral affections, in which, as the result of influenza or any other disorder which causes an increased flow from the glands of the mucous membrane of the nose, the antrum has become engorged, infection has gotten into the cavity, as it readily might, and for the time being there is more or less pus in the antrum. Many such cases cure themselves, and a large number of others are cured by the rhinologist in his roundabout way of reaching the trouble through the nose. Consequently, simply because there is pus in the antrum is does not necessarily follow that we must undertake an extensive operation. If the history of the case shows that pus has been there only a short time, we may reasonably infer that its destructive influence has not been great, and that the tissue is affected only for the time being and will soon recover. We therefore need only to establish drainage, and oftentimes the antrum will get well without any other treatment. However, in case it does not get well no halfway measures will do, as we must then have free access to the antrum in order to treat it thoroughly. I am an advocate of a large opening, but only when it is necessary. In that case Dr. Logan has shown us the ideal opening.

Perhaps the manner of making it might have been elaborated a little, because, as the essayist showed, when you have reached the cavity proper of the maxillary sinus, the bur can be extended downward until you have reached the lowest portion of the antrum, and you can press backward and forward until the walls posteriorly and anteriorly are felt. Then you know that you have an opening which takes in the entire floor of the antrum and which is large enough to enable you to see the cavity. At the start I do not attempt an opening large enough that I can see all parts of the antrum clearly, but I make it in such shape that when I pack the cavity the wall will be bulged out for the time being, and after one or two rather tight packings the whole surface is clearly visible.

I have tried gutta-percha plugs, but found them more or less irritating. In their place I use a strip of gauze, and dip the outer end in chloro-percha. When the last piece is pressed in I hold my

finger upon it a moment and thus fairly well seal the antrum. After that I depend on disinfecting the mouth every half hour. Instead of trying to keep the secretions entirely out of the antrum I sterilize them, and thus the duration of treatment can be reduced fully one-half.

Dr. T. L. Gilmer, Chicago: Those of you who are teaching should impress upon your students the importance of knowing how to do this surgical work in the mouth, as there are so many practitioners who seem to be afraid to do anything except fill teeth or work in the laboratory. The subject under discussion is clearly within the dental field, and the young men should be well educated along such lines.

I believe the only place to enter the antral cavity is through the buccal wall of the antrum, as we need to reach the most dependent part of the cavity so that it may be properly drained. Another important thing is to get into the antrum in such a way that we may discover its condition. To drill a little gimlet-hole and inject medicaments into the antrum is not sufficient if the case is at all serious. The opening should be made large enough to admit the little finger. The sense of touch reveals things in diagnosis which cannot be had from any sort of an instrument. Instead of a silver probe I would use a sharp-pointed steel instrument, as we cannot determine the nature of the contents of the antrum nearly so accurately with anything else. With a steel probe we can determine whether there is necrosed bone or tooth tissue or what not, provided the fingers have been sufficiently educated in the use of such instrument.

These openings into the antrum should never be made with a chisel, although the general surgeon is much inclined to its use. If you will take a piece of thin board and drive a chisel through it with a hammer you will find that the side opposite from where the chisel was used is all splintered. In fact, it is a fair indication of the condition of the inner side of the antrum wall after a chisel has been used.

When we open into the antrum and there is a condition present such as has been outlined in the paper, we need plenty of room for exploration, and if the lining membrane is badly diseased we may frequently wish to curet thoroughly, removing everything down to the bone. Then treat the case just as a surgeon would treat any other similar wound. Pack it thoroughly with iodoform gauze.

This may not in itself be antiseptic, but when iodoform comes in contact with the tissues something is evolved which inhibits the growth of microorganisms, and at the same time stimulates the parts to healthy granulation. I never use tubes, as they are usually either too long to secure perfect drainage or else they act as an irritant. I use the gauze so long as it is necessary to employ anything, and so do not see the necessity of a plug if the cavity is kept well packed, although there is no objection to the sort of plug suggested by the essayist. If the opening is made sufficiently high up, as it should be, the cheek folds over it and takes the place of the plug.

Dr. C. P. Pruyn, Chicago: One point has not been mentioned. In these cases we often find complete stenosis of the natural orifice, and the opening should then be made through the nose. I take a a trocar, a little smaller than an ordinary lead pencil, and by raising up the ala of the nose I have no difficulty in reaching back and making an opening. It is nearer the floor of the antrum than the usual opening, and on this account gives thorough drainage. Having made the opening sufficiently large, we must not only feel but also see the condition of affairs, because in many chronic cases little septa arise from the floor of the antrum, and until they are entirely removed with the curet complete drainage can not be established. Where it is necessary to make this opening through the nose in order to secure good drainage, I usually put in a rubber tube about the size of a pencil. At one end I turn it back upon itself, making a little bulge, and let that end remain just inside the nostril where it will not be exposed. The other end can be shoved back through the antrum and attached with ligatures to some of the teeth. In this way complete drainage is established, and the patient can wash out the antrum without coming to the office.

I never put iodoform in the mouth, as there is no excuse for using such stinking stuff when other remedies, aristol for instance, will do the work just as well. Iodoform is bad enough when used exteriorly, but is much worse when the patient has to smell and taste it constantly.

Dr. G. W. Cook, Chicago: I seriously object to the use of carbolic acid or nitrate of silver or iodoform as antiseptics in this disorder. A solution of carbolic acid sufficiently strong to antisepticize a cavity like the antrum will irritate the parts considerably. It depends entirely upon the microorganisms causing the inflammatory

process whether or not we secure any antiseptic results from iodoform, because it is valueless unless it comes in contact with certain microorganisms which break it up and liberate the iodin, in that way only bringing about a somewhat antiseptic condition. I have been experimenting with two or three agents and have obtained satisfactory results. One of them is chinosol. It is far more antiseptic than bichlorid of mercury, and if you saturate a piece of gauze in a ten per cent solution and pack the antrum, the results will be much pleasanter and the granulation will proceed quite as rapidly, as when iodoform or other irritating agents are employed. Chinosol is used by gynecologists, and is especially valuable because it does not possess the irritating qualities which the ordinary antiseptic solutions have. The other preparation is carbolic and sulphuric acids in equal parts. This displaces one atom of hydrogen in the phenol, producing pheno-sulphonic acid. It is slightly irritating and we cannot pack wounds with it as we can with chinosol, but it has the property of stimulating granulation, and where there is a necrotic condition of the bone it apparently has a special affinity for the diseased structure. This acid was introduced into surgery some years ago in Russia and has been extensively used there.

Dr. W. C. Barrett, Buffalo: I can not see why antiseptics are recommended for use in the antrum, and I have not used any such for a long time. If I employ chlorid of zinc or iodin it is because of their stimulating and astringent properties, and if I pack the cavity with iodoform gauze it is to secure its specific effects. I would use a disinfectant, of course, but not an antiseptic, and I should not employ such a disinfectant as peroxid of hydrogen. Electrozone, which is common sea water that has had a current of electricity turned into it, changing the chlorids and bromids into chlorites and bromites and making them strongly disinfectant, answers all purposes. It is non-irritating and non-toxic and will do no harm in the eye, stomach or anywhere about the body. I have never seen an uncomplicated case of empyema of the antrum that needed anything more than thorough drainage and a good washing out two or three times. I say uncomplicated, for if there is an ulcerated surface or necrosis or polypi the case is wholly different.

Dr. L. E. Custer, Dayton, O.: Considerable attention has been given to the importance of securing drainage in the lower part of the antrum, yet we all know that no two antrums are alike, and

frequently there is quite a difference between the two in the same patient. I would emphasize the value of the X-Ray for obtaining a correct outline of the floor of the antrum, for then at a single stroke the proper place for drainage can be reached.

Dr. C. L. Hungerford, Kansas City, Mo.: This thing has simmered down to two points—drainage and the production of antisepsis. The treatment of all pus-secreting surfaces will resolve itself to these two points, provided there are no morbid growths. A pus-secreting surface will heal itself without further treatment so soon as drainage is established, but if pathological germs are present a disinfectant is necessary. Nothing today is equal to the various solutions of formalin. Used in sufficient strength they will destroy not only all the microorganisms present, but will prevent also the formation or growth of any others which may come in. I was glad to hear Dr. Pruyn emphasize the necessity of breaking up the septa, as there is almost always one on the floor of the atrum and frequently more than that, and while they are present perfect drainage cannot be established. When morbid growths or carious bone are present the case of course calls for other treatment, but in the majority of instances drainage from the most dependent point, using a tube if necessary, and employing formalin if pathological germs are present, will result in a cure.

Dr. Logan, closing discussion: A rubber tube should never be used, for the end closes up and does not permit of thorough drainage. Futhermore, it is dangerous, as I have seen three cases where a part of the tube has been left inside the antrum. Antral trouble cannot always be cured by simple drainage. If we have an infected area and pus the case must be treated generally for several weeks, if the part is really involved, or else there will be a recurrence of the trouble. I am not speaking of the simple inflammatory condition but of empyema. Infection in the antrum cannot be cured by drainage nearly so quickly as in some other parts of the body, and when pus pockets form about bone the condition is not so simple as some imagine. I saw a case where there was an opening at the bottom of the antrum and it was washed out every day, but there was a daily rise of temperature of from one to two degrees for a few hours, due to the absorption of pus. When infection is present we frequently have the formation of polypi, and they will not be destroyed by drainage any more than fibrous growths will

disappear by drilling an opening in the bottom of the antrum. Furthermore, in a serious case a proliferation of the fibrous tissue usually occurs, so if you do not correct it you are not on the safe side. Consequently a small opening should never be made when we operate, as a large one closes very quickly if desirable and makes it possible for us to make not only a thorough examination but a conscientious operation. I always use a steel probe to discover the true condition of the bone, but to learn the form of the antrum a bent silver probe is preferable.

SECTION V.—Continued.

Incisor and Profile--A Study in Comparative Anatomy.

PAPER BY C. L. GODDARD, OF THE SECTION.

Let us turn our attention from defective teeth and their treatment, from cavities of decay, filling materials, bacteria, etc., and study for a short time the teeth of animals and see if we can learn from them anything relating to human teeth. As our time would be altogether too short for a study of all the teeth of all the animals, I will call your attention only to the teeth of mammals, and to their incisors only, their forms, uses and changes in the development. I shall not try to show all the consecutive changes, but only living examples of some of the changes that have taken place in the billions of years since mammals were developed.

The earliest teeth were simple cones, and we find an example in those of the dolphin (Delphinus Dolphis; order cetecea), a homodont mammal, whose teeth are all of the same size, with no division into incisors, cuspids, premolars and molars. The teeth are used only as organs of prehension.

Similar teeth for the same use are found in the sea-lion (Otaria Leonia); all are sharp ones. The six anterior teeth we can call incisors from their position only. The cuspids show plainly from their size, and the premolars and molars are of the same form. All are cones of dentin covered with enamel, but the premolars and molars each show one small budding cusp.

In the seal (Phoca Grenlandia) also we name the six anterior teeth incisors from their position alone. They are simple cones, situated between the larger cuspids. The premolars and molars show four or five cones in a single line, and serve for cutting. Although the two animals are cases of reversion from a higher and more complex type, their teeth are good examples of what has taken place in development of animals now extinct.

The total absence of incisors is shown in the Edentata, of which the armadillo (Dasypus) is an example. A long, slender tongue serves to draw leaves and young shoots into the mouth and renders incisors unnecessary.

Beaver. Fig. 1. Wombat.

The dog (Canis Familiaris) serves best to illustrate the Heterodonts—the division of teeth into incisors, cuspids, premolars and molars. In almost all other mammals also we find the true incisors, that is, the cone flattened into a chisel-shaped or cutting tooth. As is well known, the dog lacks but one of having the typical formula, having I 3/3 C 1/1 P 4/4 M 2/3 equals 20/22. The incisors are small, short, and meet edge to edge, and are not of nearly so much use as the incisors of other animals.

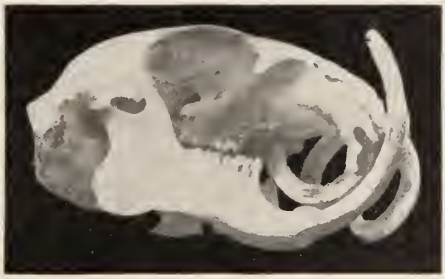

Fig. 2.—Squirrel. Elongated lower incisors.

The most perfect incisor is possessed by the rodents, of which the beaver (Castor Canadensis), (Fig. 1) is a familiar example. The labial surface only is covered with enamel, of orange color, and the dentin varies in hardness from the enamel to the lingual surface,

so that as the tooth is worn away it always preserves a sharp edge of enamel, shoved up by the softer dentin. To provide against this wear the tooth grows from a persistent pulp. In the skull from which this cut was made the external alveolar plate was cut away

Fig. 3.—Left upper incisor, corkscrew shape. Right upper incisor penetrating nasal cavity.

to show the great length of the root so firmly fixed in the alveolus to withstand the severe use demanded of it. You will see that it extends back of the posterior molar.

Fig. 4.—Comparative view of squirrels' skulls, showing lower protrusion as cause of irregularity.

The other figure (Fig. 1) shows the teeth of the wombat (Phascolomys Ursinus) of Australia, where all the native animals, marsupials (Didelphia), of the lower stage of development mimic the different orders of the Eutheria (Monodelphia), which comprise

all the animals of the rest of the world with one exception, the opossum. We find herbivora, carnivora and rodentia. It is interesting to compare the teeth of these two animals of such widely different origin. All the teeth of each are of persistent growth; both have the antero-posterior movement of the lower jaw to enable the cutting edges of the incisors, two in number in each jaw, to work against each other. The enamel of the teeth of the wombat is covered with cementum, and the incisor root extends back of the second molar.

When an incisor of a rodent is broken its antagonist continues to grow throughout the life of the animal. If from any cause the incisors fail to meet and wear each other away, the continuous growth results in an enormous development. This is well shown in the next cut (Fig. 2) of a squirrel (Sciuirus). The lower incisors extend above the upper level of the skull. The left upper has grown out laterally, coiled like a corkscrew and made almost two complete turns. The right upper incisor, making a complete turn, has penetrated (Fig. 3) the hard palate and formed nearly half a circle within the nasal cavity. By comparing the skull with a normal one (Fig. 4) you will see that the cause of this irregularity was lower protrusion; the lower incisors extending forward of the upper, so that they could not meet and wear each other.

One family of rodents, the hares and rabbits (Leporidae), have a pair of small functionless incisors behind the upper centrals.

The elephant is another familiar example of the persistent growth of the incisor, there being but two in the upper jaw. Many think their tusks are cuspids, but the fact that they develop in the intermaxillary bone shows they are incisors. The open end of the root is very near the surface of the forehead. Tomes gives an illustration of a spear-head imbedded in a tusk. He explains that it must have penetrated the skull from above and entered the open pulp-cavity. President Jordan of Stanford University humorously suggested that the elephant was a rodent whose incisors had failed to wear away.

In another fossil animal, the dinotherium, we find a curious diversion of the lower incisors. The anterior part of the lower maxilla is deflected downwards so that the incisors grow in that direction.

The fossil mastodon (Mastodon Americanus), according to Tomes, had besides the upper tusks two lower incisors that "grew out hori-

zontally from the front of the jaw." In some species these were rudimentary, were lost early or were altogether absent.

The incisors of the horse (Equus Caballus) present an anomaly

Fig. 5.—Five incisors.

not seen in any other animal. The enamel of the cutting edge dips in, is invaginated as the end of the finger of a glove may be pushed in, leaving a cup of considerable depth. As the upper and lower

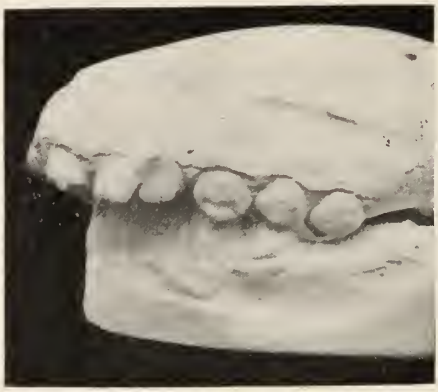

Fig. 6.—Six upper incisors.

incisors meet edge to edge, the ends wear away till the cup disappears. The varying degree of wear enables a good horseman to tell the age of the animal. In the early five-toed horse this cup does not appear, and but slightly in the three-toed. The horse is a graz-

ing animal, yet its incisors vary a great deal from those of the ruminants, of which the cow (Bos Taurus) is an example. The lower incisors, six in number, have a somewhat fan-shaped crown with a not very long root. The fourth tooth from the median line is of the same shape and size as the incisors, but classed arbitrarily as a cuspid because the eutheria never have more than three incisors. As you well know, the ruminants have no upper incisors, but a thickened pad of gum tissue against which the lower incisors close, enabling the animals to grasp the blades of grass or leaves and tear them off by a jerk of the head. The incisors of the ruminants are thus organs of prehension rather than cutting instruments.

Among cetaceans the narwhal (Monodon Monoceros) presents an anomaly. It has but two incisors, both upper, one rudimentary, but the other projecting forward out of the snout from ten to twelve feet, and from three to four inches in diameter at the base. The tusk is quite straight but is marked by spiral grooves, "winding from right to left" (Tomes Dental Anatomy.) Tomes says that rudiments of a second pair of incisors have been found in a fetal narwhal, but never in an adult.

The incisor of the galeopithecus (the flying lemur) is extremely curious. The lobes on the cutting edge, such as are noticed in the human incisor, are prolonged to such an extent that the divisions extend almost the whole length of the crown. The tooth looks like a comb, and some naturalists insist that the animal uses it as such.

Of the marsupials, the kangaroo (Halmaturus) shows a curious and interesting arrangement of the incisors. There are six upper and two lower ones. The six upper are arranged in parabolic curve, the third incisor being as wide as both the others. The two lower incisors project forward in a horizontal line, as if to prolong the lower jaw, which is relatively short. The crowns are long, straight and flat on their mesial surfaces, so that they fit inside the lingual surfaces of the upper as one jaw of a plate-cutter fits inside the other. They have no deciduous predecessors.

The domestic hog (Sus Domestica) has three incisors on either side of each jaw, diminishing in size from first to third; the lowers are quite procumbent. There is a diastema between the upper second and third incisors. This is the only existing animal that has the typical number of teeth, forty-four.

The lemur, next lower than the monkey, has the upper incisors more nearly resembling the human, but the lower are very slender, quite procumbent, and vary in number from three to one. I show here a jaw in which the lower cuspid has the shape of an incisor, while the first premolar has taken the form of a cuspid.

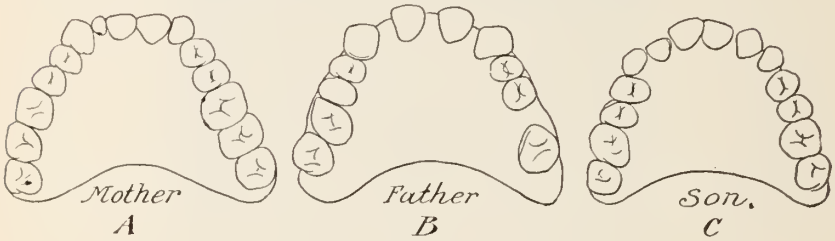

Fig. 7.

One point I wish particularly to bring out in this review is, that in placental mammals the normal number of incisors is three on either side of each jaw, and that while a few orders have less none have more than that number. In marsupials the number varies from one in the wombat to five in the opossum.

New World Monkey. Fig. 8. Old World Monkey.

Leaving now all mammals excepting the quadrumana, we find the dental formula of all the old world monkeys (Catarrhine), to be the same as that of man, viz.: I. 2/2, C. 1/1, P. 2/2, M. 3/3. The general shape of the incisor is the same as that of a man, but in the gorilla and the orang outang much larger and heavier. While in most animals the incisors meet with an edge to edge bite,

the upper incisors of the quadrumana and of man close over the lower, so that they pass by each other in the lateral movements of the jaws in mastication. In monkeys the incisors are arranged in the arc of a larger circle than in man; and the premolars and molars are in nearly parallel rows. See the jaws of the gorilla, although the marmoset shows the Bonwill triangle. This little monkey has a larger brain case than any other in proportion to its size, and is the only one that has no third molar.

In man there are occasional reversions to the lower types, more often in the number of incisors than of other teeth. We sometimes find five incisors and occasionally six. These supernumerary teeth may be of normal shape and in regular alignment (Fig. 5), or may be reversions to the primitive cone. Generally the attempt of five or six teeth to arrange themselves in the space provided for four results in a simple irregularity, the supernumeraries being crowded out of the arch. Sometimes the result is a constitutional irregularity; the alveolar process building itself up around the five or six teeth arranged in a more prominent arch. Fig. 6 shows a case of upper protrusion due wholly to the presence of six incisors. What was the remedy? Simply that of nature, the suppression (extraction) of the third incisors and pressure on the rest to reduce the size of the arch.

In our higher civilization nature in many cases is continuing her work of suppressing incisors. Sometimes the lateral reverts to the form of a simple cone, but is so frequently absent altogether that we have become accustomed to speak of it as the missing lateral. Sometimes this is hereditary. Fig. 7 (A, B and C), shows three members in one family—the mother with but one lateral incisor, the father with none, and the son with but one.

The size and number of posterior teeth have an influence on the position of prominence of the incisors that is not always noticed except by those interested in orthodontia.

Fig. 8 shows the profiles of two monkeys of about the same size, one of the new world (Platyrhine) and one of the old (Catarrhine). The first is the more prognathous, that is, the incisors, both upper and lower, are much more prominent than those of the other; but what is the difference? While the normal number of premolars in placental mammalia is four, the monkeys of the American continent have three, while all the others have but two. Nature has reduced

the prominence of the incisors by reducing the number of premolars.

In the practice of orthodontia we do the same thing. Fig. 9 (A) shows the teeth of a girl of seventeen. The incisors, both upper

B. Fig. 9. A.

and lower, are very prominent, a case of double protrusion. The teeth are too large for the jaws, which are of less than normal size. The first bicuspid (premolar) was removed from either side of each jaw, and the anterior teeth forced back as shown in the second cast,

A. Fig. 10. B.

Fig. 9 (B). Fig. 10 (A and B) shows the effect on the profile of face, and the reduction of protrusion of the upper and lower incisors.

While studying the human profile let us examine two cuts given as standards. Fig. 11, from Kingsley's "Oral Deformities," shows

a profile given as the artist's standard. Fig. 12, from a recent text-book on Orthodontia, shows the profile of Apollo, recognized by all artists as the type of manly beauty. To the eye the two look quite different. The chin of the second seems too prominent, and that of the first not prominent enough. In the second a vertical line touching the most prominent portion of the forehead and chin cuts off half the nose. In the other the vertical line does not touch the chin. To study their relation to each other, I went to the Mark Hopkins Art Institute, a department of the University of California, and made photographs of a plaster cast of Apollo Belvidere,

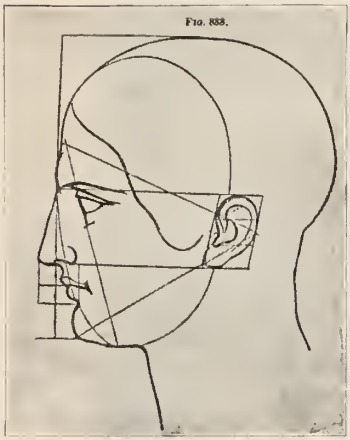

Fig. 11. (Kingsley.)

Fig. 12. (Angle.)

the marble original of which is in the Vatican, and of which all modern pictures or statutes of Apollo are supposed to be copies.

On one photograph I drew lines like those on the profile from Kingsley's book (Fig. 13). A horizontal line was extended from the lowest point of the lobe of the ear to the lowest point of the nose. Its position in regard to the chin is about the same as Kingsley's. On a duplicate photograph I drew a line from the forehead to the chin (Fig. 14), and found to my surprise that it cut off two-thirds of the nose instead of one-half. A vertical line from the most prominent part of the forehead, bisecting the nose, will not touch the chin. I found the discrepancy between the two apparent rather than real, and due to a difference in the vertical

line, or really to a difference in the inclination of the head. I learned one important thing, however, from this comparison, which is, that the published profile of Apollo, showing the nose bisected by a line from the forehead to chin, is wrong, either the chin is too prominent or the nose not prominent enough.

Since writing this paper I have had an opportunity to examine at Beloit College, Wisconsin, the plaster casts exhibited by the Greek

Fig. 13.

Government at the World's Fair in 1893. These casts are all reproductions of classical marble statues, and among them all I did not find one in which the nose was bisected by a line from forehead to chin. In all of them two-thirds of the nose projected beyond such a line. Among them was a statue of Hermes (Mercury) bearing the infant Dionysus (Bacchus), made by Praxiteles in the 4th century B. C.

In studying the profiles of our patients we must bear in mind the

vertical line that, touching the forehead and chin, cuts off two-thirds of the nose. If it bisects the nose the chin is too prominent or the nose not prominent enough. If a vertical line from forehead to chin leaves more than two-thirds of the nose beyond it, either the chin is not prominent enough or the nose is too prominent. We must study the head at different inclinations to determine this.

In orthodontia we must study the contour of the lips in relation

Fig. 14.

to this line. A case of upper protrusion may be apparent rather than real, due to a short chin. If the prominence of the upper lip is reduced by pushing back the upper incisors it will leave the nose too prominent. Such a case may sometimes be greatly improved by moving forward the lower incisors and thus pushing forward the lower lip only. In some cases the profile can be improved only by "jumping the bite" and moving the chin forward.

To recapitulate, our study of incisors in comparative odontology

has shown that in animals the number and uses vary, but that three is the typical number, which in the quadruma is reduced to two; that in man there is occasionally a reversion to three, but more often a reduction to one; that upper protrusion may be due to a reversion to a more primitive type, and that the protrusion may be reduced by lessening the number of incisors; that in some monkeys nature has reduced a prominence of the incisors by reducing the number of premolars from three to two, and that in orthodontia we produce the same result in man by reducing the number of premolars from two to one; that in the normal profile of the human face a line from forehead to chin cuts off two-thirds of the nose; that the position or inclination of the head must be studied to determine whether a faulty profile is due to prominent chin and deficient nose or prominent nose and deficient chin, and that our treatment must be in accordance therewith.

Discussion. *Dr. A. O. Hunt*, Chicago: Whatever expression there is in the human face is confined mostly to the lower fourth of it. In criticising the facial angles as represented by the cast of the Apollo Belvidere many things must be borne in mind. This is a classical face—an ideal condition that has been reached not by finding same in any one individual, but like the ideal form of the human body, it is a composite of all the best types and proportions of many individuals. This is from the standpoint of the artist. In all these figures and faces, both in sculpture and painting, the work at that time was wholly ideal, it was some time later that artists began to work from the actual human form. The study of these ideal forms, except to take them as standards by which we may work in restoring the expression and shape of the human face, is of no special value to us in its application to dentistry. In fact, the classical ideas, forms and proportions are very misleading, because we at no time deal with a human face which is classical in its proportions and outlines. We are constantly meeting faces that show only variation from the artist's idea, and instead of studying ideal conditions our purpose should be to harmonize each individual face by itself. We must always remember that the question is not one of constancy, but of continual difference in every characteristic. From the artist's standpoint the human face is divided into four equal parts lengthwise, but as we usually see it these parts do not harmonize, and the lower fourth of the face may be longer than the

middle or second portion. The best type and condition, that which indicates the highest intellectuality and the most perfect development, is where the angle of the face is one of ninety degrees, that is, taking the base line as shown across the pictures here exhibited, when the prominent parts of the face will follow this angle when set in it. How often do we find this condition? Dr. Kingsley's illustration was entirely from the standpoint of the artist. The variation in the position of the teeth which constantly occurs causes a variation in the profile of the face, because the teeth bear a definite relation to the lips and face. When the nose is lacking in prominence we cannot change it, but we can alter the lower fourth of the face when necessary, and in so doing our effort should be to adapt all parts, so that the profile of the face shall show a harmonious whole.

Dr. C. N. Peirce, Philadelphia: Dr. Goddard's illustrations are most remarkable. Although I have been a student of compartive dental anatomy for many years, I never saw the crania of the various animals brought out so beautifully as he has done it. The question that we must ask ourselves is, what has produced this great variety of forms? Is there some mechanical force which has influenced them, giving to one a certain tooth and to another quite a different shape? I assume that they are all subject to mechanical influences, and when we consider the domestic animals and the modifications that have taken place in them, we are certainly justified in believing that it is simply the food which gives the force and is the factor fixing the shape of the jaw and of the teeth. The nine-banded armadillo has teeth without any enamel, which are simply degenerated from teeth with firm enamel on the surface, and their condition shows that the modification of the food habit has produced this result. Our domestic horse has also lost a tooth from either side of each jaw, now having but forty instead of forty-four. Whenever there is an increase in the size of the brain case we find a lessening of the length of the lower jaw and a crowding out of the teeth.

Dr. W. E. Walker, Pass Christian, Miss.: I would call attention to two errors, one in the paper and the other in the discussion. We were referred to the illustration of the Apollo Belvidere in Angle's work on malocclusion, and it was stated that the line was drawn so as to bisect the nose. I obtained that impression when first reading the book, but seeing that it did not apply in practice I reread the

article and found that I was mistaken, just as the author of the paper is. Dr. Angle states that the line bisects the alae of the nose, but not the nose itself, which leaves out of consideration its anterior third.

Dr. Hunt stated that we could modify only the lower fourth of the face, which certainly is not correct. This would ignore the greater part of Dr. Case's work. His models are casts of plaster poured into plaster impressions of the face, and no one would think that he has artificially made them by building up. An examination would remove any doubt in this matter. In these casts we see that the nose is modified, yet it cannot be considered in the lower fourth of the face.

Dr. Goddard, closing discussion: When anything is represented by a picture we refer to the drawing more than to the words of description, and I still think the expression "to bisect the alae of the nose" would mean bisecting the nose, taking the alae in that case to mean the whole width of the nose as we see it in profile. The drawings and photographs of patients published as standards certainly bear out that view. In regard to the simple harmonizing of the features in our work, how can we know that they are harmonized unless we have in our minds some standard? These classical profiles are our standard, and we cannot expect to reproduce them, but having the ideal in our minds, to harmonize the features, as Dr. Hunt says.

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Fig. 2.—Bodies removed from so-called dentigerous cyst (reduced in size one-third).

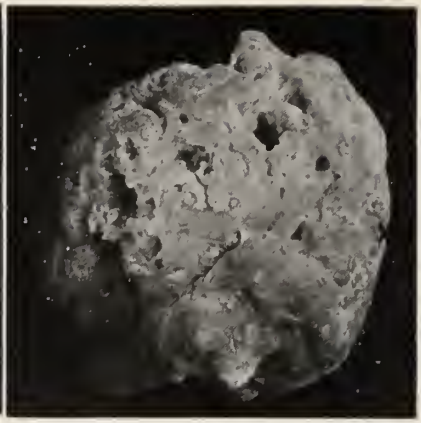

Fig. 6.—Large oval Odontome (magnified 2½ X).

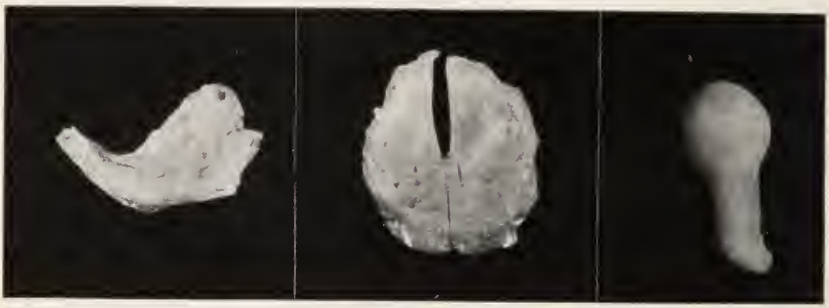

Fig. 1.—Tumor on cuspid tooth (actual size).

Fig. 7.—Dr. Black's Odontome, from which the photomicrographs were obtained (magnified about 1½ X).

Fig. 5.—One of the diminutive teeth from Fig. 3 (enlarged six times actual size).

Fig. 3.—Oblong Odontome, composed largely of diminutive teeth (magnified 2 X).

Fig. 4.—Opposite side of Odontome shown in Fig. 3. (magnified 2 X.)

Photographs and Photomicrographs by Dr. F. B. Noyes.

SECTION V.—Continued.

Odontomes.

PAPER BY T. L. GILMER, OF THE SECTION.

Anomalies in tooth forms have ever been a source of interest to the histologist and pathologist, and did we include all forms of these growths under the head of odontomes we might conclude that they are by no means rare. If, however, we may restrict the term to those growths which are composed of tooth tissues, thrown together in a heterogeneous mass, and those made up of dentary bodies either remaining in nests formed by the follicular wall or held in one mass by cement—then, if the meagre reports of such cases found in the literature represent their frequency of occurrence, they are exceedingly rare

In presenting this subject it is not intended to make an arbitrary classification in opposition to such learned men as Broca, J. Bland Sutton and others. It does seem, however, that for the purpose of a more simple differentiation we may remove with profit all classes of tumors from under the head of odontomes, excepting the kinds of growths above mentioned. These growths are so different in character and perhaps in origin from the others that they may be placed under one head and very properly be denominated odontomes.

Broca was the first to classify certain tumors of the jaws, including these kinds, naming them odontomes embryoplastiques, odontomes odontoplastiques, odontomes coronaries and odontome radicularies, this classification having reference to the part of the tooth from which the tumor has its origin.

Sutton enlarged upon this and gave a classification based on the nature of the growth and the part of the tooth germ from which the tumor originated. His classification is;

Epithelial odontome, from the enamel organ.
Follicular odontome,
Fibrous odontome,
Cementome,
Compound follicular odontome,
} from the tooth follicle.
Radicular odontome, from the papilla.
Composite odontome, from the whole germ.

There is much to commend in this classification, but it is so broad that it may include many forms of growths which it would seem cannot, strictly speaking, be classed as odontomes, or tumors composed only of completed tooth tissues. It does not seem that there is justification in giving the name odontome to a tooth having an excessively developed crown or root, or to a tooth having a tumor on the side of the root, Fig. 1, or to a tooth having an enamel drop on the side of its root, or to a tooth more or less perfectly developed remaining in a thickened follicle or to a tooth having its follicular wall thickened and calcified. Neither does it appear correct to include multilocular cysts of the jaws, excementosis of the root, impacted teeth, or unerupted supernumerary teeth under this head.

All of these are sometimes classed by writers on the subject as odontomes. Thomas' Medical Dictionary defines odontomes as "a sort of exostosis of the teeth." The Century Dictionary defines an odontome as "a small tumor composed of dentin formed in connection with a tooth. The name is applied more loosely to other hard tumors or growths of teeth, as to dental osteomas or exostoses springing from the cementum." A tumor *caused* by a tooth is one thing, but a tooth tumor, that is, a tumor composed of tooth tissues, with no one tooth as a basis of the growth, is quite a different proposition. There may be some question as to whether those growths composed of nests of aberrant tooth forms ununited by cement, but included in a follicular cyst, should be placed under the head of odontomes. Since there is no difference in this class of tumors from those known by Sutton as composite odontomes, other than the absence of the cement, their origin probably being the same, it would appear that they may very properly be classed as odontomes. Sutton classifies these as compound follicular odontomes, but they are more generally referred to as dentigerous cysts.

Another form of growth very similar to the one just referred to, is made up of a mass of more or less perfectly formed diminutive

teeth, aberrant tooth forms and enamel drops. These are held in a more or less compact mass by a granular calcific material which seems to be imperfectly formed cementum.

A third class, described by Sutton as a composite odontome, is seemingly made up, if viewed macroscopically, of a heterogeneous mass of enamel, dentin and this material having the appearance of imperfectly formed cementum. There are no indications on its surface of tooth form; but when sections are cut from it and viewed microscopically, they present a surprising arrangement of enamel, dentin and cement, as will be seen later from the illustrations.

These three classes, if they may be so denominated, do not in every instance, and possibly never, originate from the germ of one of the normal set of teeth, but from some other source. They are wholly dissimilar in character to all the other growths commonly called odontomes. As to those which I should exclude from under the head of odontomes, there can be no doubt as to their origin, if supernumerary teeth are excepted. We know definitely that their origin is from some part of the germ of the teeth of the normal set which has been interrupted in its development.

I have found by experience that it is not safe to conclude that odontomes are always simply a malformation or abnormal development of the normal set of teeth. If this were universally true we should then find one tooth missing from the normal set if an odontome were present. I am unwilling to say that an odontome never originates in the stead of one of the normal set of teeth, but in two cases out of three occurring in my practice all the teeth of the normal set were accounted for. In the third case there was insufficient history on which to base a positive opinion. So far as I know, no one in his embryo-histological investigations has discovered to a certainty the origin of supernumerary teeth or odontomes, therefore all knowledge we have on the subject is purely speculative.

. Dean theorized that the epithelial cord after its separation from the enamel organ might not in all instances be wholly absorbed, and that these unatrophied persistent portions of the cord might, in the presence of the underlying connective tissue, be able to stimulate in it an activity which would result in supernumerary teeth, and we might add, in those other growths under the smaller classification which I have designated odontomes. If this theory be correct, then the supposition that odontomes are simply the result of an error in

development of some one of the normal set of teeth does not necessarily follow.

Black has found in a few instances that there are additional buds given off from the epithelial lamina, and he suggests that these may be the origin of supernumerary teeth. If so, such buds may also account for odontomes as well.

Dermoids in parts of the body outside the jaws are supposed to be caused in some instances by inclusion of epithelial tissues during fetal development, and it may be that in the development of the jaws a part of the epiblastic layer is enclosed by the mesoblast, and supernumerary teeth and these nests of aberrant tooth forms, united or ununited, results similar to the origin of an epithelioma. However, the development in parts of the body outside the jaws of dermoids which contain hair and nails as well as teeth, sometimes in great numbers, though analogous, are not generally supposed to originate from a source similar to that of the so-called dentigerous cysts, or, as Sutton terms them, compound follicular odontomes of the jaw. Eve maintains that they are analogous to dermoids of the skin, ovaries, etc. Dermoids, according to Klebs, are classified as an endogenous form of tumor, that is, forms in which superficial tissues are retained in internal parts by a process of constriction. Teratomas he classified as ectogenous forms in which a separate fetal deposition is the origin of the tumor. Although the analogy between ovarian and other dermoids, and the so-called dentigerous cysts is striking, and one is inclined in some way to ascribe the genesis of these growths to a common cause, it appears to be the general opinion that the origins are different.

As before stated, there have been but few of the kind of growths I am describing reported, probably not more than a dozen all told. Some of those which have been classed in reports of cases as dentigerous cysts should have been placed under the head of odontomes. One such case was reported to this Association in 1875 by Dr. Edgar D. Swain; I described another case to the Chicago Odontographic Society, and there have been a few other similar cases reported under the head of dentigerous cysts.

Odontomes are generally found in the posterior portion of the jaws. Most writers on the subject say that they are more commonly found in the lower jaw. Two of the three cases I have seen were in the upper jaw. They are developed in early life, and as a

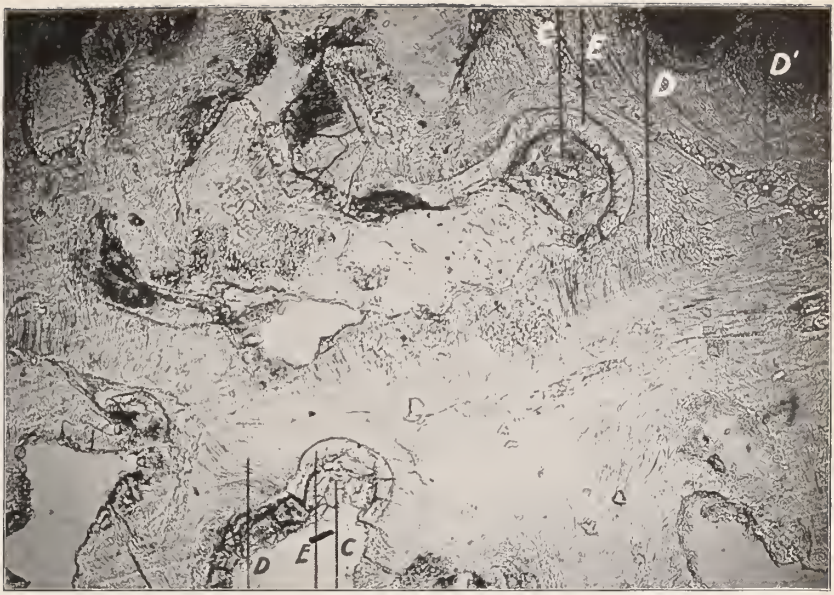

FIG. 8.—A. A. Zeiss, Obj. About 85 X (reduced one-half). Ground section from Odontome, Fig. 7.

E—Enamel in the form of little caps. D—Dentin. D —Dentin, showing interglobular spaces. C—Irregular calcific material of the nature of imperfect cementum.

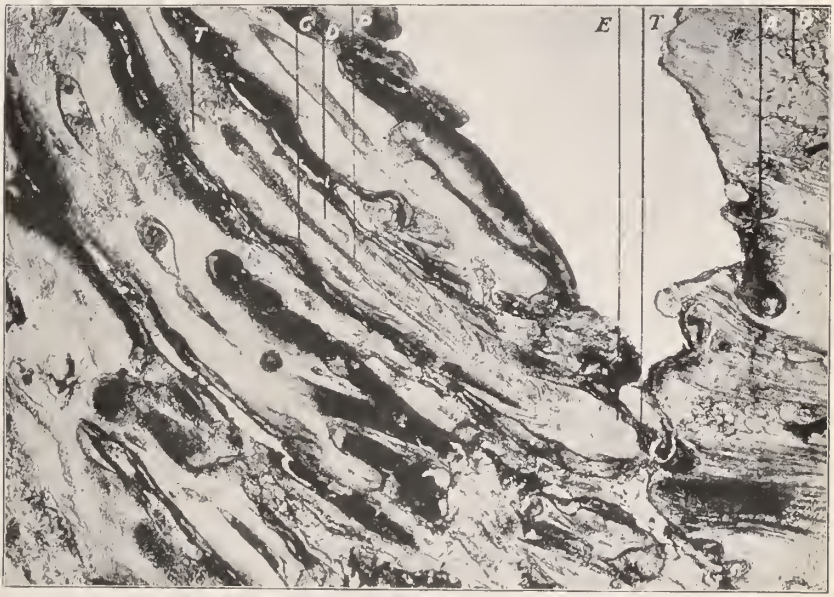

FIG. 9.—35. M. M. Zeiss, Obj. About 42 X (reduced about one-half). Ground section from Odontome, Fig. 7 (reduced to about one-quarter).

T—Little tooth or denticle. D—Dentin. D'—Dentin, showing interglobular spaces. A—Absorption areas. E—Enamel cap. P—Pulp chamber. C—Cementum or irregular calcific material between denticles.

Photographs and Photomicrographs by Dr. F. B. Noyes.

rule are observed before the twenty-fifth year. Odontomes rest in the jaw surrounded by a wall which in all probability in the majority of cases is the persistent follicular wall of the growth, expanded and thickened. In that class in which the dentary bodies are not united in a solid mass the follicular wall is spread out, forming nests in which the bodies rest. Sometimes these bodies have been found in great numbers. There were seventy-nine in my case referred to above. In this instance none of the bodies had a strong likeness to normally developed teeth. In other cases reported of this class, Swain's for instance, the bodies had the shape of very perfectly formed teeth, though diminutive in size, of cuspid and bicuspid types. Fig. 2 shows bodies removed by me from the growth previously mentioned. This came from the left side of the upper jaw of a boy twelve years of age. The tumor was located toward the buccal side of the jaw, all of the normal teeth were in place except the third molar, which was not yet erupted, but was found and removed at the time of the operation.

Fig. 3 represents a remarkable growth which I removed from the right side of the lower jaw of a young man at my clinic at Northwestern University Dental School during the last session. Fig. 4 shows the reverse side of this odontome. The history of this case, as given by Dr. Chas. S. Leininger of Chicago, who brought the patient to the clinic, is as follows: "Patient A. A., aged nineteen years, presented Oct. 7, 1900, for treatment for a supposed alveolar abscess, seemingly caused by a badly decayed right lower second molar. A large quantity of pus was drained off and the roots of the tooth removed two days later, the swelling of the gums disappeared shortly afterwards, and the patient had no trouble until six weeks later. The case showed at this time a condition similar to that when first seen, excepting for the absence of pus. I cut a considerable portion of the gum from the enlarged jaw and packed in borated gauze, expecting to find a third root, but in this I was disappointed. The opening I made relieved the patient of pain, but the enlargement gradually increased in size and extended buccally and distally. Two weeks after making the incision in the gum patient again presented with active inflammation of the part." When I first saw the patient the condition was as described by Dr. Leininger. On probing with a sharp-pointed explorer I made out a hard rough body which gave the characteristic sensation received when tooth tissues

are touched by an instrument. The body was too rough and large to indicate a tooth. The appearance of the gum and the discharge of pus, which was now present, indicated necrosis of bone, but the sensation communicated by the explorer clearly contradicted it. I at once concluded that an odontome was present. The first molar was in place, but loose from absorption of its roots, so was removed. The second molar had been removed by Dr. Leininger, and the third molar was not yet erupted. The jaw was much enlarged buccally and lingually. I made an incision anteroposteriorly and raised flaps of gums on both sides, exposing the jaw and a portion of the growth to view. The overlying process was cut away. I found most of the bone absorbed on the buccal aspect of the jaw and but little left on the lingual surface. With drills and cross-cut fissure burs I cut away the bone on the buccal side of the growth and also a part of that left on the lingual aspect, when the tumor with some difficulty was pried from its bed and removed, after which I found posteriorly at the bottom of the cavity the third molar seemingly perfectly developed. This odontome is the most remarkable one I have ever seen. It is composed of diminutive teeth, Fig. 5, more or less perfectly developed, of the incisor, cuspid and bicuspid types, and large numbers of denticles and enamel drops, cemented together within this oblong crescentic mass. This odontome measures anteroposteriorly 34 m. m., bucco-lingually 18 m. m., and from the crown rootwise 19 m. m.

Fig. 6 shows an odontome removed by me from the upper jaw during the past winter. The patient was twenty years of age. All the teeth were in place except the second molar. The first molar was loose from absorption of the roots caused by pressure of the odontome. The patient was quite sure that very recently he had had the second molar removed, but I saw no positive indication of this. This is the only one of the three cases in which I lacked positive evidence of the presence of the three molars, as well as all of the normal set of teeth on the side of the jaw in which the odontome was found. This case was sent to my clinic by a practitioner for an operation for necrosis, the odontome having been mistaken for a sequestrum of bone, which was not surprising, since the body had the characteristic brown color of necrosed bone, and there was much swelling and a flow of pus, with the dark colored gums. On probing the mass with a sharp steel instrument I readily discovered

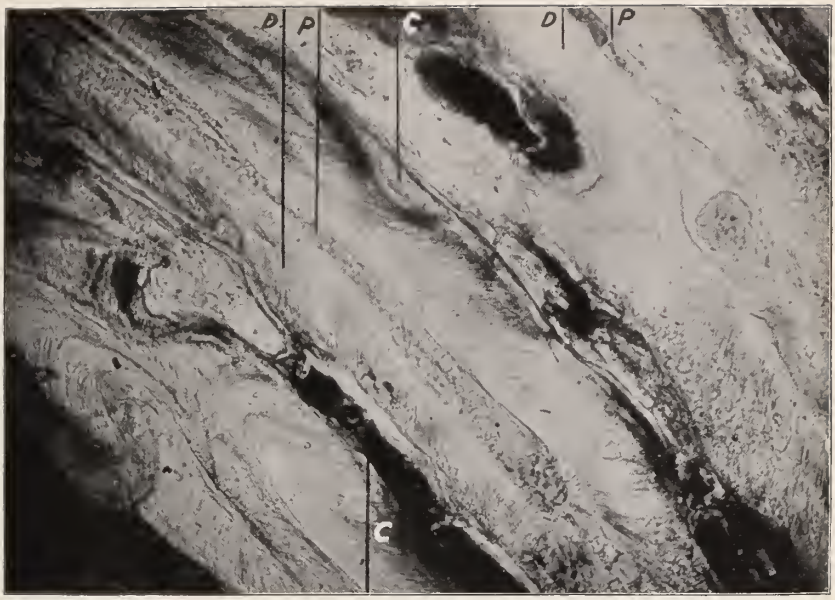

FIG. 10—A. A. Zeiss, Obj. About 85 X (reduced about one-half). Ground section from Odontome, Fig. 7.

P—Pulp canals containing calcific material. D—Dentin. C—Cementum, or very irregular calcific material between denticles.

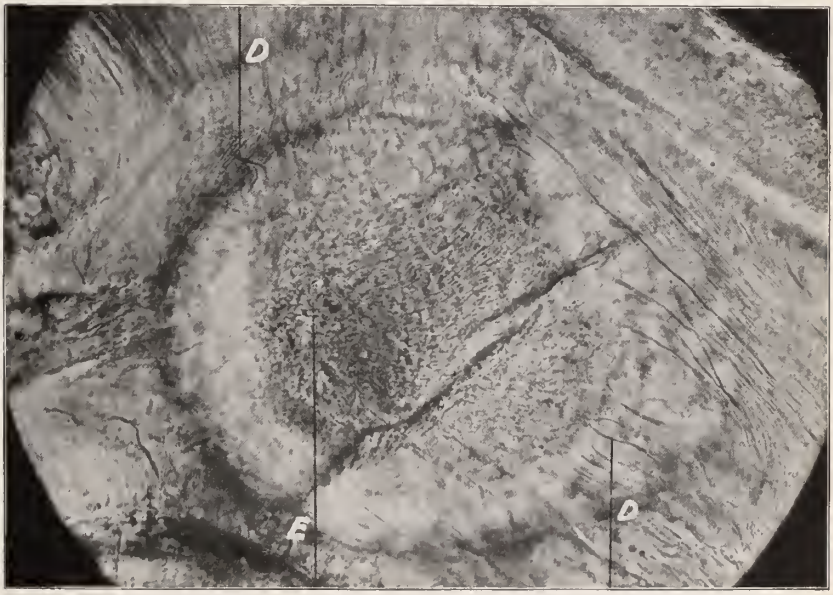

FIG. 11.—D. D. Zeiss, Obj. Occ. No. 2. About 500 X (reduced about one-third). Ground section from Odontome, Fig. 7.

E—Enamel. D—Dentin, showing characteristic forking of tubules next to enamel.

Photographs and Photomicrographs by Dr. F. B. Noyes

that I was not dealing with dead bone but with tooth tissues, so diagnosed the case as an odontome. The jaw was much expanded buccally and somewhat lingually, causing considerable disfigurement on the outside of the face The loose first molar was removed and the growth enucleated, but not until much bone was removed. Above and posterior to the growth, in the socket from which it was removed, was found the third molar perfectly formed. This growth is spherical in form, with an irregular surface caused by the protuberances. It measures in its greatest diameter 28 m.m. and in its least 22 m.m. It differs from the other in that there are no definite tooth forms visible, but enamel, dentin and cement irregularly placed, therefore it belongs to the third class.

Fig. 7 is another of the third class. This case was reported by Dr. Black to the Illinois State Dental Society in 1879. It is a somewhat smaller growth, measuring 24 m m. from before backward, 20 m m. from side to side, and 14 m.m. from root to crown. It is again presented, as Dr. Black ground sections from it, and from these sections Dr. F. B. Noyes has made photomicrographs and lantern slides which show most beautifully and perfectly the characteristic composition of this class. In the report to the Illinois Society Dr. Black said, of the histological appearance of these sections: "For the purpose of examining its structure I sawed it through, halving it in an antero-postero-perpendicular direction, and cut some sections. I found all the tissues of a normally developed tooth but in a state of confusion. Figs. 8, 9, 10, 11. There is entire absence of any proper pulp cavity. The disposition or arrangement of the tissues is peculiar and striking. It is as though there were a thousand teeth, exceedingly minute, growing as closely together as they could be crowded, and the interstices between them filled up with enamel and cement. In the field of the microscope, with the sections I have, we shall often be able to see a number of these diminutive teeth at a single view. Each has its own little pulp chamber in due form, its own separate dentin, and its own enamel cap, and plastered in and about and added on to those there is a considerable amount of both enamel and cement of very irregular formation. Many of the pulp chambers are partially filled with calcospherites. These also appear in many parts of the specimen in profusion. It is interesting to note the resemblance of this odontome to the normal structure of the teeth of some

of the lower orders of animals, especially some species of fishes, in which there are branching and radiating pulp cavities. These forms are well described by Chas. Tomes."

All writers on this subject agree that diagnosis of odontomes is generally difficult; usually they are not suspected until the growth is removed, and cases have been reported in which, through a mistaken diagnosis, sections of the jaw have been removed with the idea that a malignant growth was present, thus disfiguring the patient unnecessarily. With our present aid in the X-ray, together with the use of the sharp steel explorer and a well trained touch, it would seem that there could be no excuse for a repetition of the errors of the past, such as making exsections of the jaws when an odontome or impacted or encysted tooth is the disturbing cause, a condition in no case calling for so heroic and disfiguring an operation.

Discussion. *Dr. Thomas Fillebrown*, Boston: I do not remember more than one case during the last fifteen years in our section of New England which was analogous, and that was not an odontome but a dentigerous cyst. We also had one in which about thirty small teeth were found in the cyst. When this subject was discussed in the section the opinion seemed to prevail that the teeth were confined almost wholly to the bicuspid form, although some thought that the cuspid form was more predominant. Only one or two central incisors have appeared in these pictures, and it seems to me we might say that the teeth are practically all of the cuspid type, because the bicuspid is only a development of it. However, to make the distinction more marked we should notice the almost entire absence of molars, as only one or two cases have been reported in which molars were present, and those were the deformed conical molars, but that applies more to the supernumerary teeth than it does to those in these growths. I hardly see the distinction which the author makes between odontomes as tumors and tumors on the teeth, as a tooth which is deformed by more or less protuberances becomes an irregular mass of dentinal tissue, just as much as these odontomes do. I have seen these odontomes and would say that the larger one exhibited is as big as the end of my thumb. The little teeth of which it is composed can be seen very plainly, and there must be hundreds of them. The tooth substance predominates largely, there being just enough calcific matter to hold the mass together.

Dr. W. H. G. Logan, Chicago: It is correct to term cysts with one tooth dentigerous cysts, but when there are a number of teeth, as in the case of an odontome, it is not a cyst at all. I think an odontome is a tumor, aud when we have one tooth involved within a membranous sac, that is a cyst. A tumor is a gradual growth of new tissue without any function to perform, which is what an odontome is. We have a proliferation of tissue, enamel and dentin, forming the tumor, which is an odontome. When we have the presence of a supernumerary tooth or a permanent tooth coming down, and it is lodged, as a result of that lodgment secretions arise around that body and act as an irritant. The irritation produces a fibrous sac which eventually encloses the teeth, and that is a dentigerous cyst. As regards the frequency, I have seen three dentigerous cysts and one odontome operated upon.

The most important point is the diagnosis. For fear that some might think infection or pus was a diagnostic symptom of odontomes or of cysts, inasmuch as it was mentioned in the paper as an accompaniment, I would say that in the presence of a cyst the foreign body is enclosed within a membranous sac. Under ordinary conditions there is no escape and we have no infection, but by and by we have a breaking down as a result of absorption.

The differential diagnosis between tooth structure and necrosed bone should be emphasized. This can be determined, as the essayist has emphatically stated, only by the use of a steel probe. When there is an enlargement, and you are in doubt as to what is inside of it, make an exploratory opening in every case before you operate. By listening quietly and feeling carefully you can determine at once what is present, as it is easy to distinguish between tooth structure and necrosed bone.

Dr. W. C. Barrett, Buffalo: I would call attention to the close relationship of the so-called supernumerary teeth to odontomes, dentigerous cysts and every thing of that character. We can learn much from comparative anatomy. I have a specimen taken from a colt in which there are nearly a quart of the denticles, some of them having the form of the anterior incisors, with that peculiar invagination of the enamel which gives the so-called age mark of the horse, and others having the characteristic crescentic infolding of the enamel which distinguishes his molars. From this we may learn that many of these peculiar growths are simply undeveloped

teeth, in one sense, and most of them are composed of true tooth tissue. Then, if we take up the so-called supernumerary teeth we find them to a certain extent following the same type. I think these latter are simply a return to ancestral developments. I believe the great archetype of dentition to be forty-eight teeth, which means that certain animals have eight molars in each jaw, others eight premolars, others six incisors and two cuspids. That is the greatest number of teeth found in any animal if we exclude the didelphia, which are themselves an exception as they belong to an entirely different class. No one has them all. At present no mammal has the eight molars and the eight premolars but some have six molars and eight premolars or vice versa. I have never seen so-called supernumerary teeth which made up a number to exceed the typical number of the teeth. In the molars of a human being I have seen the fourth molar distinctly and perfectly developed and in line with the others. I have seen it still more perfect in some of the nearly allied animals of the primates, especially in the gorilla and chimpanzee, but I never saw so-called supernumeraries which made up a number to exceed the four molars. Further, I have never seen in any other animal enough of the supernumerary teeth to exceed the eight premolars in each jaw, nor anything in the incisor teeth which made an excess in number of the six typical incisors. Consequently, it seems to me that they follow directly in the line of these others, but that in the dentigerous cysts so-called, or odontomes, it is simply a multiplication of denticles which should go to form one composite whole.

Dr. J. S. Marshall, Washington: I would say that this is the most important paper from the histological standpoint that has been presented before this association for a number of years. Dr. Gilmer stated that odontomes are exceedingly rare in the human family, which is true, as I believe only about fourteen cases have ever been reported. In the lower animals, however, these tumors are very frequent. I had one taken from the jaw of a colt and it was as large as my two fists, and another, taken from a young steer, was made up of probably hundreds of these denticles cemented together. Dr. Finley had a case which has never been reported. Dentigerous cysts are much more common than odontomes, and we often find the former to be caused by the misplacement of a single well developed tooth which cannot erupt. At other times we find these cysts filled

with denticles. The case which Dr. Gilmer recently operated upon had more denticles in it than any other on record except one, in which over three hundred were found. Mr. Sutton speaks of another form of tumor—a follicular odontome which seems to be made up of a large number of small cysts, the cancelli of the bone apparently forming these cysts and enclosing a large amount of fluid but never any denticles; simply an enlargement of the cells or cancellated structure of the bone. The diagnosis of these odontomes is often difficult, for usually they are deeply imbedded. In the only case of the kind which came under my notice I discovered the mass with the steel probe by the sense of touch. In all other cases of which I have read the surgeon has tried to determine the character of the tumor with a silver probe, but it cannot be done. I also attached one end of a small piece of rubber tubing to the probe and the other end to an ear piece. By placing the latter in my ear I was able to hear distinctly the peculiar sound given off, as well as to feel with my fingers the sensation imparted, when the probe came in contact with the odontome. This conglomerate tissue neither feels like bone nor gives off the sound of bone when touched.

Dr. M. F. Finley, Washington: Dr. Marshall has spoken of the case in my practice of a bulbar odontome. The patient, an adult female, presented to have a loose tooth removed. In fact, it was so loose that it would no doubt have dropped out in a short time, not being covered in any way by either soft or bony tissue. There was no swelling of the jaw. The odontoma was located on the tuberosity of the right upper maxillary bone, in the position of a third molar, and the surface of attachment was concave with radiating serrations, something like the under surface of a toadstool. When the mass was removed so much odor came from it that I immediately threw it in the wash-basin and turned on the water, not realizing its true nature. Some time elapsed before its character was revealed, and the patient being a transient I could not obtain any history of the case. On one surface of the mass there was what appeared to be a molar-shaped tooth, considerably curved in its outline and having a large foraminal opening. There was also a great deal of tartar attached.

Dr. Gilmer, closing discussion: I must disagree with Dr. Fillebrown, as there is a great difference between a tumor growing out from the side of a root and an odontome. If we have in the development

of the papilla an extrusion of a part of this organ, we may have just such a tumor as has been spoken of, and it would certainly bear no sort of similarity histologically or otherwise to an odontome. I said little about the diagnosis of these tumors, because I did not wish to tire you, and as I tried to keep the paper within bounds I did not go into the question of comparative anatomy, nor consider these growths in the lower animals. Dr. Barrett states that forty-eight teeth are the type, and that there are never more of these bodies than would correspond to the original type. If he will examine closely one of the specimens I have here he can count three or four times that many, and they may all be separated.

Dr. Barrett: True, but together they make up but the one. An odontome is simply a multiplication of a single one and should be counted as such.

SECTION I.

Prosthetic Dentistry, Crown and Bridgework, Metallurgy, Chemistry and Orthodontia.

Splints for Retaining Loose Teeth.

PAPER BY W. V-B. AMES, OF THE SECTION.

In really desperate cases of pyorrhea the matter of first importance is the satisfactory mechanical fixation of the loose teeth, without which all scaling and medicinal treatment will amount to little.

Had the title of my paper remained as first given to the chairman of the section—"A Properly Constructed Bridge the Ideal Splint for Loose Teeth"—my entire claim would have been embodied in the title and there would have remained only the effort to prove the ground well taken. My excuse for presenting to you a paper on this subject still is that I feel that sufficiently radical means are not adopted for the mechanical fixation of loose teeth affected by some form of pyorrhea. I claim that the tying or binding with ligatures, silk or metal, with or without a gold blank struck up to fit the lingual or palatal surfaces of the teeth; the fitting and soldering together and cementing upon the teeth of thin gold bands, which should follow the line of greatest circumference of the tooth crowns, or the use of ligatures reinforced with celluloid in solution, as was advocated by Korwarska last summer at Paris, are all trifling makeshifts and should be employed only as emergency procedures.

I claim that within certain extreme limits in pyorrheal conditions, when edentulous spaces need to be filled, the indications for cutting teeth off at a point near the gum line, properly forming the roots, and constructing a bridge fitted with extreme care and judi-

ciously antagonized with the occluding teeth of the opposite jaw, are forcible almost in proportion to the hopelessness of the case. This will be looked upon by probably a large majority as a very radical and unjustifiable practice, but acting upon this belief for about five years has given me results which have been out of all proportion to the outcome of less radical procedures.

In pyorrhea cases in which a few or many teeth are loose without the complication of edentulous spaces, or even when an occasional tooth is missing, a very efficient splint can be constructed after devitalizing, as a general rule, by fitting plates to a surface of each tooth and a dowel to enter the pulp canal, and assembling these by soldering. Such attachments can be made to carry a few dummies very satisfactorily, and the aggregation could be properly called a bridge. A few forms of such appliances have been described and illustrated—that of Dr. W. L. Fish, shown in July *Cosmos*, I can readily understand was efficient.

In making an appliance for any case in which there are teeth so loose that their retention calls for some radical procedure, I believe that the first consideration should be the devitalization of the pulps of the affected teeth. A loose tooth with a vital pulp is generally a source of neuralgia, so for various reasons is better pulpless. Of the more or less firm teeth which are to be included in the apparatus for stability, the pulp may often be left in situ with safety.

There seem to be natural advantages in favor of constructing bridges upon loose roots in the lower jaw, while in the upper the same cause might not be indicated. I refer to the simple force of gravitation. It is fortunate that pyorrhea, etc. most often affect the teeth of the lower jaw, and of that set the incisors. However, by careful attention to articulation of an upper bridge built upon loose roots much can be expected of them. By attending carefully to the frequent sealing, and by the use of hydrogen dioxid as a mouth wash, I have come to expect to extend the usefulness of such a denture many years. Even with neglect after the insertion of such an appliance a case will do astonishingly well, as the tissues will usually tolerate abominably rough and ragged roots if they are immovably fixed in their sockets by means of a mechanical appliance.

I wish to describe in detail only one appliance which I think is sufficiently novel to warrant it. The construction of this depends

upon the practicability of using natural tooth crowns, after they have been amputated from their roots, for mounting upon a metal frame-work of a bridge. This use of the natural tooth crown I consider most often warranted when treating looseness of the six anterior lower teeth, as they are probably the most difficult to reproduce satisfactorily in porcelain, and the occlusion usually comes upon them in such a way that they are a support and brace to each other. Each is the keystone of an arch, while the reverse is usually the case in the anterior region of the upper jaw. Very often these lower teeth are abraded and so stained that their reproduction in porcelain is not easy, and when they have occupied positions not in regular alignment a much more pleasing result can be obtained by remounting the natural crowns.

Before amputation of a crown an impression should be taken of the incisal edges of the tooth to be amputated and of one or two on each side, as a guide in replacing the crown if the original arrangement is to be carried out. Selecting the line at which we wish to amputate the crown, a spear drill is passed through the center from labial to lingual, and with a small fissure bur the excision is made laterally from this perforation.

After shaping the root portion as if for an ordinary case of banding for crown, take a measurement and cut material for a band of the combined widths of the bands desired upon root and coronal portions. After fitting to root and giving the entire band this general form it is well to take an impression of the gingival end in some sort of firm material to preserve its shape while fitting into it the coronal portion, which has been beveled slightly and the pulp canal which has been enlarged to receive a No. 17 wire. By cutting out the coronal edge of the band labially and lingually the tooth crown can be readily forced into it, there being usually the necessity of slightly stretching the margin lingually and labially to suit the natural enlargement of the crown just above the point of amputation.

With crown in band place these two parts in position upon root to assure proper relations. When these have been secured, mark upon the outside of band a line corresponding with the termination of the coronal portion within. This I can best do with an instrument identical in construction with an artery forcep. By placing one beak of an artery forcep against the cervical end of the crown,

and the other beak against the outside of the band, the termination of tooth crown within can be readily outlined upon the outer surface of the band.

A diaphragm is now to be inserted at this line. A flat saw is selected of a thickness corresponding to the gauge of gold intended for the diaphragm. The band is so nearly divided, following this line, that the saw begins to mark the inner surface of the band at a point opposite that at which the sawing was begun. A flat piece of gold of the selected gauge—I prefer about 29—can now be inserted in this slit and easily fastened at all points with a small amount of high-grade solder. This diaphragm I prefer to have extend labially and lingually to such an extent that it will act as a support to the proper amount of solder for strengthening the part and on the one approximal aspect to such an extent that it will come into contact with the adjoining similar part to facilitate the final assembling.

The next step is the placing of a dowel through the diaphragm into the prepared pulp canal of the tooth crown. The soldering of this dowel, which in case of an incisor is cut to be flush with diaphragm, and in case of a cuspid would extend into root as well, is the most delicate and difficult part of the process. I feel that I can best do it with the oxyhydrogen flame.

After these details have been carried out with all of the teeth which it is intended to include in the appliance, they are placed upon their roots and an impression is taken; the crowns are then put aside and the parts assembled, the individual parts being strengthened at this time, or having been strengthened separately before assembling. Before cementing the tooth crowns into their sockets, I find it an advantage to drill a small canal from one approximal surface, which will be just covered by the band, to the enlarged pulp canal of the crown, this to be a vent to facilitate the cementing process. After cementing all tooth crowns into their sockets and finishing you have a bridge which in its final setting does not differ from any other, except in the looseness of the roots which necessitates the use of a cement which sets satisfactorily from a thin consistency, such as an oxyphosphate of copper.

If, as will sometimes be the case, it is desirable to give a tooth crown a different position from that which it has occupied, the root and coronal portions are banded, coped and doweled separately, and these so united as to give the crown the desired position. This

method may by some be considered best in cases in which the position of crown is not to be changed. The first described plan is apt to be the more expeditious. The parts of single teeth can be temporarily put together and worn by ligating, while other teeth are being gotten ready for the final assembling of all parts. This procedure is not a short cut method. It will require several appointments for its completion and will of course be too extravagant for some of our clients. I present it as an efficient means of accomplishing an end in a desperate condition. The advisability of its adoption must be decided after consideration of the exigencies of the case.

Discussion. *Dr. N. S. Hoff*, Ann Arbor, Mich.: I have no criticism to make on the mechanical construction of the bridgework or splint advocated, but this is not very conservative practice. The idea of treating these desperate cases of pyorrhea with some sort of a steadying appliance is all right, provided that the apparatus is not given the permanence which this method of treatment indicates. It seems to me that the essayist has gone too far in making a sacrifice of tooth crowns, to say nothing of the other tooth tissues, and I do not believe in always destroying the pulp. When this form of a bridge is inserted the healthy teeth are permanently mutilated, as it is intended to serve as a fixture until the teeth are finally lost. Consequently, this method is not the proper therapeutic treatment of the disease. Therapeutic intervention is usually directed to the restoration of a normal condition for the time being only, and when this has been accomplished, so far as the gums and disease of the alveolar process is concerned, we expect nature to take charge and maintain a healthy function. Dr. Ames' method is surgical only, and when the normal condition has been restored the bridge must be retained. Again, by fastening these teeth together in this way we abolish entirely one of their most important functions, the individual tactile sense, which enables us to appreciate with the teeth the value of food particles taken into the mouth, to say nothing of the certain destruction of their individual occlusion. There are other methods of attaching splints which will serve the same purpose, and if desirable they can be removed at a later date, allowing the teeth to resume their natural function. Finally, while the essayist may be right in stating that by this method the possibility of the neuralgia often associated with this condition is overcome, there are other ways of preventing excessive sensitiveness, and

there is little necessity for destroying the pulp to accomplish that object.

Dr. W. F. Litch, Philadelphia: I think Dr. Ames' operation is too radical for splint purposes pure and simple, and for the typical case which he seems to have in mind, the six or even the four lower anterior teeth, as there are simpler and less destructive splints which might be applied to greater advantage. In a case of this kind, if simple ligatures were not indicated I should prefer to make upon the lingual surface of the lower incisors a series of plates carefully burnished to each tooth, the plates being soldered together, making a continuous one which would be accurately adapted to the individual teeth. The plate could be perforated between the teeth and ligatures could be passed through and tied upon the labial surfaces of them. They might be of thread, but preferably of wire. Such a plate could be fastened in position with gutta-percha, to protect the tooth surfaces. The only palliation for the operation described by Dr. Ames in the average case is the assumption that the presence of metallic bands beneath the gum around teeth affected with pyorrhea is a salutary measure, in that it sets up certain processes, possibly galvanic, and destructive to organisms. However, the presence of the metallic band beneath the gum-line might be secured in some other way. I like the essayist's idea of using natural teeth, and have several times employed that method. I remember particularly two cases in which I made these contour plates, and they were each worn for about ten years with much satisfaction to the patients. I have occasionally followed the practice of employing bridges as anchorages or for the fixation of loose teeth. The largest bridge I ever made for a case of this kind involved some eight teeth remaining in the upper jaw, and extended from third molar to third molar. The anchorages were so complicated that I had to make two interlocking sections in order to introduce the bridge at all. It lasted about ten years, but ultimately became loose and had to be removed.

Dr. S. H. Guilford, Philadelphia: For the most part I believe the method of Dr. Ames is very good, but with Dr. Hoff I must object to the practice of devitalizing the pulps of firm teeth in order to brace up loose ones, because I think the result can be perfectly accomplished without it. I have tried all methods of litigating teeth, and have found that the best plan is to put narrow gold bands (the ordinary figure-eight bands) around the teeth. They should

be as little conspicuous as possible, and be placed near the gum line but not extending beyond the enamel. Of course the best results would be obtained if we could pass them along the incisal edge, because the resistance would then be removed as far as possible from the fulcrum of the tooth, but that would be too noticeable. The bands can be fitted to each tooth very accurately, after which an impression is taken and the bands are soldered together and are held permanently in place with cement or gutta-percha. Dr. Hoff speaks about the desirability of each tooth having the natural tactile sense. That is all very well so long as they are reasonably firm in their sockets, but we do not have that function in bridgework, and where a number of artificial teeth are firm and virtually immovable they are comfortable. The natural teeth should be made comfortable if artificial appliances can be. Dr. Hoff also spoke of having the appliance removable, but I do not think it at all advisable. When teeth have become loose, whether from ordinary resorption or active pyorrhea, they probably are not going to last many years. After a splint has been put on we proceed to treat those teeth and to get them into as healthy a condition as possible, and I do not think any one would propose taking the appliance off and allowing the teeth to stand alone as they did before. They will need support so long as they are in the mouth, and this splint is intended to be kept on until they are lost. Whatever plan may be adopted for extending the usefulness of loose teeth, I think the appliance should be inconspicuous, should hold the teeth firmly, and should allow of the teeth and itself being kept clean.

Dr. J. D. Patterson, Kansas City, Mo.: I am surprised that so many of the speakers have opposed the destruction of pulps in teeth severely affected by pyorrhea. Those who have had considerable experience in the treatment of this disease desire the absence of the pulps of those teeth in every instance when the affection has progressed so far that an appliance of this kind is demanded. The tactile sense referred to does not come from the pulp and is not interfered with by destruction of same. While Dr. Ames' plan is somewhat complicated it has its good features. I fully agree with him that all methods of using ligatures for the retention of these loose teeth, except for very temporary purposes, are a delusion and a snare. From a considerable experience I would earnestly advise you not to depend upon any makeshift. We want an appliance

which can be cemented on and which will hold each tooth immovable, so I invariably use a permanent splint, something the same as for a fractured jaw, cementing it on. Nothing is so important as an absolutely solid retention of these loose teeth in order to bring about their recovery, and you cannot do it with any form of ligatures. A splint with burnished gold back of the tooth and with silk ligatures attached is one of the vilest appliances that I have ever seen in the mouth. A method which I have employed with lower incisors recently has been permanent and satisfactory to both me and the patients. I make a metal model of the teeth to be retained and upon it swedge a band of gold to the lingual surfaces, then drill holes through the teeth, between the pulp and cutting edge, to receive a small gold wire, which is soldered to the plate at the proper point. The plate is then reenforced with a layer of solder, the rubber-dam put on, and the whole cemented firmly in place. The pins in the tooth are cut off even with the surface of it, so that no gold shows except the end of the little pin which is not visible eighteen inches away, and the splint is not unsightly. It is far from the gum, so that the tooth-brush will reach the interproximal spaces just as if no splint were present. We should never think of putting wires close to the gum, as some have recommended.

Dr. D. R. Stubblefield, Nashville, Tenn.: The essayist made himself very clear as to confining the application of this process to extreme cases, and did not refer to those which are remediable under different circumstances and with different appliances. He spoke only of those cases where desperate remedies are demanded because desperate conditions are present. Consequently, the discussion should be confined to this class of cases and to the expediency of preserving the crowns of the natural teeth. It seems to me to be utterly impossible to preserve normal conditions where such a desperate state has been reached, so all we can do is to keep the parts in a more or less healthy condition, impressing upon the patients the fact that they must be their own doctors between their visits to us. I agree that the use of peroxid of hydrogen in the treatment of these mouths is wise practice, and I think altogether Dr. Ames' method is the best for these desperate cases. The destruction of the pulps is certainly expedient. The use of natural teeth was given up long ago, because they are subject to progressive,

though perhaps slow decay, but often the patients desire the old teeth kept and in such cases we should do so.

Dr. Garrett Newkirk, Los Angeles, Cal.: Where applicable I have never seen anything better suggested than Dr. Ames' method. If the operator has proper manipulative ability it should be perfectly successful. It is eminently proper to destroy the pulps in these desperate cases of pyorrhea, and it often happens that when the pulps are removed success follows what seemed to be a hopeless case. I remember one instance several years ago which seemed to be utterly hopeless, but after removal of the pulps from the lower incisors the parts were restored to a healthy condition and have remained so until this day. Dr. Hoff thinks this is not conservative treatment, but it seems to me eminently conservative. I fully agree with the criticism that has been made upon those appliances which are fastened with ligatures. Of all things, deliver us from the vegetable fabric ligatures or thread, except for temporary uses. Wire is also a difficult thing to manage, is apt to be in the way, and seldom can be depended upon for any length of time.

Dr. Litch: I am no special advocate of ligatures, and the process which I mentioned occurred to me only as a possible alternative. I should never think of applying it where a permanent splint was required, for no one cares to continue tying ligatures indefinitely. I would criticise Dr. Guilford's statement that it is easy to make a series of perfect fitting rings passing over the cutting edges of the lower incisors near the gum line, for such is not my experience. There is such a divergence in the shape of the lower incisors at the cutting edge and at the gum line that anything which will fit the one cannot possibly fit the other. Another trouble with a series of these rings soldered together and cemented on is that the cement is continually washing out. For an otherwise hopeless case I heartily approve of Dr. Ames' operation, and I have often secured considerable benefit from devitalization of the pulp, especially in matured teeth afflicted with pyorrhea.

Dr. E. A. Bogue, New York: I wish to express my appreciation of the method which Dr. Ames has set forth. I am surprised, however, that he should wish to match natural teeth, as nowadays I supposed gold crowns were the only things for front teeth, judging from what we see all about us. This question of the loss of tactile perception with bridges is worth careful consideration. My

personal experience in the manufacture of such things is limited, but I have seen a good many which came from various eminent operators, and I believe they all break away from their attachments at all points save one. Why can we not adopt Dr. Wm. Davenport's plan of attaching these bridges at one point and letting them simply rest on the others? A woman patient recently remarked that she had left a well known dentist because his motto seemed to be, "In case of doubt, pull." We are indebted to Dr. Ames for the suggestion of another practicable means of avoiding that extremity, and if he shall succeed in devising a plan as efficient as this one, and at the same time more accessible to those of us who have not his manual dexterity, he will do us a still greater favor.

Dr. V. H. Jackson, New York: There is one very important feature of this subject which should be considered. Dr. Ames states that he replaces the roots of teeth that have become separated from their sockets because of calcareous deposits or pyorrhea. My experience has been that such teeth can never again become attached to their alveoli, and I referred to that subject some years ago before this Association. My idea would be to introduce the root of some other tooth that has not been thrown out because of these troubles, and that would not continue to irritate the tissues of the socket, but around which the tissues would become healthy and thus afford a support that would help maintain a bridge:

Dr. Ames, closing discussion: I wish to express my satisfaction at receiving so little adverse criticism. I expected much more, because this was presented as a radical measure. I was disappointed when Dr. Hoff criticised this as unconservative treatment, at the same time speaking of cases in which the teeth are to be fixed for a short time and the appliance is to be taken off after they have been cured. I earnestly tried to show that I was not talking about that class of cases. Just in proportion to the desperateness of the case is some such operation called for. I presume that in the condition of which I speak Dr. Hoff would extract. I believe the fitting of so-called figure-of-eight gold bands, as described, is an imposition on the patient, and is on a plane with the "entire gold crown" dentistry of which Dr. Bogue speaks. When by destroying a pulp, amputating some teeth, and putting on an inconspicuous series of bands, you can rigidly fix teeth which at one time were so loose

that the patient had no use of them whatever, I call the result conservative dentistry.

Probably my models gave the impression that I believe in extending such an appliance to the cuspids in most cases, but in actual practice this would be the exception, as in the normal arrangement of the teeth the laterals are so supported by their contact with the cuspids that only the four incisors need to be included in the splint. The apparatus spoken of by Dr. Litch I described as an inlay post anchorage, and I think it was illustrated by the model of the upper denture which has been passed around. I should not in any case depend upon ligating that appliance to the teeth, but would cement it in some way. I find gutta-percha most satisfactory, and often depend upon a very thick solution of it. The shrinkage in the hardening of such a mass is not detrimental, and the more I see of the results of gutta-percha attachments the more favorably I am disposed towards them. For some reason a loose attachment of gutta-percha is not accompanied by decay and softening as a loose attachment of oxyphosphate would be. Dr. Litch was mistaken in thinking that I made any reference to the salutary effect of bands. I argued only the salutary effect of mechanical fixation, which in the appliance advocated calls for the use of bands. In regard to what Dr. Jackson said about returning these roots to their sockets, I said I did not care whether there was an attachment or not. Probably there would not be, because in these cases there is no bone. We are simply putting the root back into a fleshy socket for the conformation and better general condition which it gives.

SECTION II.

Dental Education, Literature, Nomenclature, Histology and Microscopy.

Bacteriology.

PAPER BY C. N. PEIRCE, OF THE SECTION.

Occurrences which are obscure or have causes not immediately obvious we term phenomena. When time and experience reveal their application to the economy of life they are termed natural law. Not infrequently the development of the individual to unravel the mystery and demonstrate its value to present and succeeding generations is tardy in materializing.

The solar system waited many centuries for Galileo, Kepler and Newton to satisfactorily explain its structure, operation and complex movements. Fabricius, Harvey and Malpighi made generation, physiology and anatomy of the human body comprehensible by years of patient study. Franklin, by interrogating the lightning in the clouds, made electricity the servant of man, and in the transmission of thought it annihilates time and space. Buckland, Lyell and Agassiz bore eloquent testimony to the natural but sublime history of the rocks and fossils, and the age of man and animals was greatly extended. Cuvier, Carpenter and Spencer elaborated the principles governing society and the trend of the simple to the complex, and established the sciences of biology and sociology. Lamarck, Darwin, Wallace and Huxley demonstrated descent with modification and established the origin of species and principles of evolution. Cope, Leidy, Le Conte and Marsh faithfully studied

laws of development, vertebrate zoology, paleontology and comparative anatomy, and established the close relationship between animals. Farady and Tyndall established the movements of the glaciers, studied the drops of water, the rays of light, and proved the reign of natural law.

M. Louis Pasteur, engrossed in his experiments of crystalline facets in the tartrates and paratartrates, and in the molecular symmetry and dissymmetry of crystals and the range of chemical processes apart from the play of vitality, had his attention directed to ferments by a German manufacturer of chemicals, who found that mineral substances sullied with organic matter of various kinds fermented when dissolved in water and exposed to summer heat. In this solution Pasteur discovered the fermentation due to the multiplication of a microscopic organism which in the liquid found its proper aliments. In this little organism he recognized a living ferment, which on examination he believed to be analogous to the yeast plant—the alcoholic ferment to which his attention had been directed by Schwann. Following this Pasteur made some remarkably successful experiments with the seeds of the common mould, *Penicillium Glaucum*. This brought the noted scientist unexpectedly amid the phenomena of fermentation, and that ferments in all cases are living things was his conclusion, also that the substances formerly regarded as ferments are in reality the food of the ferments.

He proved the ferment of lactic acid to be an organism of one kind, that of butyric acid to be one of a different sort. Following this he was led to the belief that the capacity of an organism to act as a ferment depended on the solution in which it was immersed, and also its power to live without air. The fermentation of beer suggested to him this idea. The yeast plant, like many others, can live either with or without free air. In contact with the latter it is spared the labor of wresting from the malt the oxygen required for its sustenance. He finally divided these microscopic organisms into two great classes which he named respectively aerobies and anaerobies, the former requiring free oxygen to maintain life, the latter capable of living without it, but able to wrest this element from its combination with other elements.

It is to Schwann, however, that the scientific world is indebted for the first successful effort in sterilization. He placed decoctions

of meat in flasks, boiled them, then supplied them with calcined air, the power of which to support life was unimpaired, yet fermentation or putrefaction in these vessels never occurred. Hence, the legitimate conclusion was that putrefaction was not due to contact with air but to something suspended in the air which heat would destroy. This something consisted of living organisms, which nourished themselves at the expense of the organic substance and caused its putrefaction.

The acetic fermentation was next studied, and was found to be the result of a minute fungus, the *Micoderma aceti*. By this the sugar of the grape-juice is transformed into carbonic acid and alcohol, the latter remaining in the wine. The manufacture and maladies of wine occupied his serious attention. Each of the disorders of wine was traced to its specific organism, which, acting as a ferment, produced substances agreeable or otherwise to the palate. Through the influence of the illustrious Dumas, Pasteur took up the investigation of the diseases of the silkworm at a time when this industry was in a state of ruin. Acquainted as he was with the work of living ferments, he was prepared for any emergency. Within the circulation of this insect he discovered the cause of the epidemic. The diseased corpuscles he followed through all the phases of insect life, the eggs, the worm, the chrysalis, the moth. In the latter it reached development so distinct as to render its recognition immediate. From healthy moths healthy eggs were sure to spring; from healthy eggs, healthy worms, and so on through the cycle of changes. By care in feeding, and isolation of diseased from healthy worms and eggs, the difficulty was surmounted and the industry reestablished. It was no hypothetical problem, the trouble was in a definite organism. Wherever ferments are utilized the microscope and results must test the quality of the true torula or yeast plant. The germ theory of infectious diseases was the result of the researches of Pasteur and Schwann. Pasteur was not a physician, and he did not feel himself called upon to trench upon the domain of the healing art, but by his studies and experiments he established the parasitic character of the several diseases affecting fowls, sheep, dogs and cattle.

The work, so valuable, done by Dr. Koch on splenic fever (malignant pustule) with the life history of *bacillus anthracis*, the contagion of this fever, is but a service in honor of Pasteur. The

recital of the foregoing evidences of increasing knowledge show that the demands of the age have daily utilized all that has been evolved, until the philosopher's stone and the transmutation of metals are relics of the past.

Alcoholic fermentation was for many years supposed to be the seat of active, spontaneous, self-regulated change; its results were known but its origin and processes had not been revealed. The chemist assumed that the decomposition which took place was due to the aggressive action of the oxygen of the air and the preventive process was simply its exclusion. On the publication of Pasteur's work this spontaneous idea entirely passed out of mind, though it had been accepted as a fact by even scientific men who held that it was the simplest explanation of the origin of the swarms of microscopic organisms observed in putrefying liquids or infusions. When we recall the universal ignorance concerning the nature and complexity of various forms of life and note the utter unreliability of any theory regarding them, it is not surprising that abiogenesis should have been held so firmly in favor and with so much confidence. Yet Leeuwenhoek, a microscopist of marked ability for his time (the seventeenth century), held that the entire absence of abiogenesis in the higher forms of life made it very improbable that the lower or even lowest should have such an origin; these conclusions, while not based on any recognized scientific evidence, were certainly wise even though intuitive or instinctive.

The germ theory of disease has done much towards relieving the world of a sorry superstition. Pestilences, epidemics and plagues are now, with scarlet-fever, measles, small-pox, whooping-cough and numerous other diseases with which the human family are afflicted, looked upon as due to natural causes rather than as the visitation of an angry God.

Bacteriology has been defined as a subdivision of microbiology and as the science of the culturable microorganisms, but it must not be inferred that all such organisms are harmful to more complex or highly organized beings. The number of those that are not only benign but quite essential to the life of man is greatly in excess of the harmful or malignant types. It would be difficult to conceive of the condition of our environment were we but for a limited time to be deprived of the helpful though unseen activity of the myriads of these organisms. Prof. W. S. Sedgwick brings this

matter clearly before us when he refers to their influence in the following terms: "Without their activity the habitable world and the sea would become one vast charnel-house, because there would be no adequate agency for mineralizing dead matter. * * * We have only to think of their helpful and wholesome unseen activity in removing from our view the dead animal bodies which would otherwise cover the earth, the dead leafage of the autumn, the worn-out trunks of trees, and the waste matter of human and animal life, in order to appreciate in some measure their fundamental importance in nature. When to this we add their tendency to cause the destruction of valuable organic matter, such as food and timber; their function in producing those fermentations, putrefactions and poisonings of the human body which we know as epidemics, plagues, pestilences, infectious diseases, suppurating wounds, gangrene and the like; when, furthermore, we consider their causative participation in such universal, familiar and important processes as bread-making, brewing, vinegar-making, the fermentation of milk and its products, butter-making, cheese-making, lactic-acid manufacture, tanning and nitrification, we are in a position to understand something of the scope and significance of the culturable microorganisms, and therefore of bacteriology from a practical point of view."

With these important facts before us it should be borne in mind that microscopic life is in its largest influence beneficent to humanity, and the varieties associated with disease are comparatively few in contrast with the others. While these minute organisms have been definitely identified with special diseases, many have serious doubts as to whether it has been satisfactorily demonstrated that they are the cause and not the product of the condition. The presence of these organisms in nearly all diseases is fully recognized, but their influence, as we see, is somewhat conjectural. The query is, will future generations modify the modern teaching?

From published reports we learn that physicians have much difficulty in establishing positively the absence or presence of the bacilli in certain diseases, hence the embarrassment in declaring that the disease does not exist, yet their presence would be considered positive evidence of the disease. This difficulty must be a great source of confusion to the diagnosticians, and must be increased by another uncertainty mentioned in their reports, namely, that they, the bacilli, vary greatly in number within a

limited time. Another serious difficulty encountered is that bacilli have been found on nasopharyngeal surfaces and on the tonsils when there has been no systemic disturbance, and also after serious trouble has subsided their presence has been recognized. If these statements are correct they must add to the uncertainty of the influence of the germs and make them a precarious feature of a diagnosis.

The origin of bacteria and the study of bacteriology have been an extremely interesting scientific feature in the last thirty years. The scope or field is broad and valuable, offering great compensation for laborious and painstaking cultivation, but this must be done with a full appreciation of the danger of careless and hasty conclusions.

Discussion. *Dr. C. P. Pruyn*, Chicago: Several years ago we went to the other extreme, but of late we have been taking a more conservative view of the part that bacteria play in disease. Indeed, physicians generally are drifting somewhat to the other extreme, and are beginning to see how large a sphere is occupied by clinical evidence, signs and symptoms in the treatment of disease. Perhaps we have laid too much stress on bacteriology and have neglected the influence of that clinical experince upon which our fathers placed such dependence. The pendulum has now swung back to its proper place, and we are beginning to realize that we should use both the old-fashioned signs and symptoms and the bacteriological presentation of each case before we can with certainty diagnose the trouble and remedy the diseased conditions.

PRESENTED TO THE COLLEGE OF
DENTAL AND ORAL SURGERY OF
NEW YORK BY THE DEAN
WILLIAM CARR, M.D. D.D.S.

SECTION III.

Operative Dentistry, Materia Medica and Therapeutics.

Mallet as a Source of Energy

PAPER BY CLAYTON H. STEARNS.

The mallet from a mechanical standpoint affords a simple solution of the problem of concentration and application of energy with which we are all familiar. Its use from long habit has become almost instinctive. One would never think of using a riveting hammer on a swage block, or a swaging hammer to head a rivet. It is only in peculiar situations that we find any difference in practice, one of these is in dentistry. Here mallets of many materials from steel to leather and in all weights from half an ounce to half a pound are in use, and each user thinks his the only one. Why is this? Is it not that from the nature of its use we cannot employ its full capacity, consequently its limitations are not forced upon us as in other ways, and that we have never taken the trouble to study its peculiarities?

We now propose to study these peculiarities and limitations and their causes. This carries us at once into the field of dynamics, and what appeared so simple a problem has become infinitely complex. How intricate and involved we can perhaps imagine when, as stated by Williamson, to determine the result of contact of two spheres, we have no less than thirteen unknown quantities, and thirteen equations expressed in terms of the calculus. He then intimates that the subject of impact is but little understood, having never been thoroughly investigated. Although the consideration of these questions opens up such a wide field, the principal laws that govern are comparatively simple and such as can be readily shown.

We have an apparatus familiar to every student of physics, although a modification of the usual form, as in this case the balls are of hardened steel. Lifting a ball at the end of the line and letting it fall, we notice that the life, motion, power, force, energy, call it what you will, seems to leave it so soon as it touches the next, and passing through the line enters the last ball, which swings off with the same energy the first had. As it falls back the action is repeated and we have the swing of a pendulum, divided equally between the two. Should we wish to increase the arc through which the second ball swings, the other remaining the same, we naturally increase the weight of the first and raise two balls, letting them fall together. As we have doubled the weight and the fall is the same, we have doubled the energy and may expect the last one to rise twice the distance. Instead, two balls rise and only the same weight as before. Possibly the weight being divided has an influence. We now take a lead ball the same size and one and one-half times the weight, letting it fall as before, when the last ball rises only half so far as before and two others follow at unequal intervals, all moving. Lead is not elastic. We try an elastic one and obtain the least effect of any. All the balls swing a short distance together, except the first which recoils slightly.

These experiments are sufficient to indicate the difference in impulse of the various mallets in use, the first producing an impulse of high tension; the second double the impulse with the same tension; the third a heavy impulse of low tension; the last a slight impulse of very low tension. The volume of impulse is governed by the weight of the moving body, the tension by its velocity, measured in this case by the distance of its fall, varied in both respects by the ability of the material to transmit.

Find how these differences are produced. We may for this purpose divide materials used into two classes, elastic and inelastic, each varying from hard to soft. Of course we have all grades of variation in both respects, but to study we need consider only the extremes. First we take an elastic substance and for convenience a soft one; rubber meets both requirements. Upon knocking or pressing two balls together we notice they are compressed or flattened in proportion to the amount of force used, and that they exert a force in opposition or an expansion force equal to it, in other words, the compression stops only when these forces are equal. This being

the case, it is obvious that in the impact of an elastic substance upon an unyielding one it will come to rest at the instant when these forces are equal.

It also follows that the first force will have all been expended the instant motion ceases, therefore only the force remains which tends to restore the original form, the expansive force, this we can measuse by the rebound. The proportion which this expansive force bears to the first in effectiveness is termed the coefficient of restitution. It is never equal to unity, as a portion of energy is always lost in various ways. Given two equal bodies, one at rest, the other colliding with it, we again find the impact divided into two stages of compression and restoration. The second body being movable, it is evident that as the first gives up energy by loss of motion, the second will acquire motion by its reception in a like degree; therefore at the instant of greatest compression both bodies will have the same velocity. The expansive force then coming into play, being equal to the first and acting on both bodies alike, must decrease the velocity of the first by an amount equal to that already given up; this being one-half, will reduce it to rest; the second being increased by a like amount will have the same velocity originally possessed by the first.

Regarding the difference in elastic bodies, between hard and soft with the same material opposed, it is apparently nominal, while in fact there is a wide one which becomes apparent so soon as we break up these couples. That difference is in the depth of compression or the amplitude of change in form, introducing the element of time, an important factor. It is self-evident that with the same initial force it will require a much longer time to pass through a wide amplitude of change in a soft substance than the narrow one of the hard, and it follows that the tension must be in inverse ratio to the time occupied in transmission. Thus, an impact transmitting ten units of energy in one unit of time will give a tension of we will say ten; while one transmitting the same energy in two units of time will give a tension of but five. If the work requires a tension of four we have in the first case three-fifths of the total used in work, and two-fifths to be taken up by outside resistance. In the second we have only one-fifth used in work and four-fifths in outside resistance, a difference of three times the amount available for work to one-half the outside resistance, equal to six times the amount of

work to the same unit of resistance in favor of the quicker transmission.

With non-elastic material the first part of the impact is the same as before, compression takes place until the velocity of the two bodies is equal. There being no expansion the second part does not follow and the two bodies move as one. With a material so hard as to have no compressibility the tension of energy transmitted can therefore not possibly rise higher than one-half the initial tension.

With a soft material we have in addition to this to take into account the molecular tension, that is, the tension of force required to produce change of form. In this case such a proportion of the initial energy will be lost in transmission as the molecular tension is less than the tension of energy as—a body moving with ten units of energy at a tension of ten, and with a molecular tension of four, will lose six units of energy in transmission, and the remaining four will be reduced in tension one-half, giving but four units of energy at a tension of two, showing that in the transmission of energy by impact the higher the coefficient of restitution and the molecular tension, the greater the amount of energy transmitted and the higher the tension.

Having considered the material, we will not consider the mass or weight of the moving body. For this we have the simple rule—the energy of moving bodies is directly as their mass and the square of their velocities. As a mass of one pound moving ten feet per second develops energy to the amount of one hundred foot-pounds, or a mass of one hundred pounds moving one foot per second develops one hundred foot-pounds. Although the figures are the same no one would think of the results of impact being the same, yet how shall we express that difference. In default of a better method we offer this: Let the mass express the volume of energy and the square of the velocity the tension. In the first case we would have one volume of energy at a tension of one hundred; in the next a volume of one hundred at a tension of one. Given an idea of their qualities and capabilities, we thus see that the greater the weight the greater the volume of energy transmitted irrespective of the velocity. Its working qualities, however, depend not on the volume but on the tension, and this is governed solely by the velocity.

We have an apparatus designed to illustrate this. It is built somewhat on the plan of the cross-bow which some of us were familiar with when younger. Instead of the bolt then used we employ two steel hammers, one of which weighs six times as much as the other. For resistance we employ blocks of soft pine resting on a plane surface. We judge the tension of the force with which the hammers strike by the distance to which they will drive nails in the blocks. We can also measure the entire force by placing resistance enough behind the blocks to take up all this force, and noting the distance to which the nail is driven. We measure the force applied to the hammer by the number of rubber bands used. By experiment we find that with the same number of bands the light hammer will drive the nail much further than the heavy one where no resistance is placed behind the blocks; on the contrary, with full resistance the heavy hammer will drive the nail much further. We also find that to get the same effect from the heavy hammer that we did from the light one without extra resistance, we must increase the number of bands in proportion to the weight of the hammer, thus giving it the same velocity; but in doing this we have increased the the total energy in proportion, showing that to raise the tension without increasing the energy we must decrease the weight and increase the velocity, and vice versa.

To apply the foregoing to the mallet as used in dentistry we must regard the resistance as fixed, as we can avail ourselves of only a certain amount. If we exceed this pain and injury is caused and we must also remember that in the application of the energy we have a second impact subject to all the laws of the first. The application of energy is outside the limits of this paper, but the two subjects are so inseparably connected that it is impossible to consider one and not the other. This second impact is a peculiar one, in that we start with an inelastic material with very little molecular tension. This rapidly changes and we find the tension and elasticity rapidly increase.

What do we wish the mallet to do? (Remember we have a fixed resistance.) Place and condense large masses of non-cohesive gold? Then it must supply a large volume of energy at low tension; or to make cohesive gold as hard and dense as possible it must supply energy in small volume but very high tension, as it requires tension to produce tension. To supply the large volume and low tension of

energy of the first case we must select a very heavy mallet of a soft inelastic material. To supply the high tension and small volume of the second we must have a very light one of the hardest and most elastic material.

In introducing a large filling, to obtain the best results, considering the comfort of the patient, the rapidity with which the work can be done, and the quality when finished, we should therefore use at least three different mallets. First, for the the introduction of non-cohesive gold, a seven ounce lead or leather-faced one, as what we want here is a swaging blow that will penetrate the whole mass, the heavy blow of this mallet approximating more nearly hand pressure than any other, yet giving increased power. In building up the body of the filling, a one and a half or two ounce steel mallet, as what we want here is not to produce hardness in the gold but strength. *Cohesion.* This part may be compared to laying a brick wall, and what we want is not, as in the first case, a force that will penetrate and condense the whole mass—that is impossible, we haven't the necessary resistance—but one that will simply force the last brick into position and perfect union with the rest without raising the molecular tension higher than is necessary to produce this union. In finishing contact points, occlusal surfaces, etc., we should use a hardened steel mallet weighing one-half ounce or less, as by its use we can harden the surface until it will ring like steel, this difference showing at once in polishing.

In conclusion we will say only that we believe any one who works along these lines will be inclined to reduce rather than to increase the weights given.

Discussion. *Dr. James Truman*, Philadelphia: Probably all of you know that the history of the mallet goes back to an early period in the last century. Koecker, in writing about the mallet in 1826, called it the most destructive agent that could be used, and in 1835 Fitch equally condemned it, and he also deprecated the use of the drill moved by a bow. Thirty years ago I spent considerable time in experimenting with the mallet and looking up the laws which governed it, because in those days mallet force was seemingly not comprehended and its laws were not properly applied. Many dentists used the eight ounce lead mallet and few employed the small steel one. Dr. Stearns has now demonstrated, as I did at that time, that the half-ounce steel mallet is better for the purpose of over-

coming the mobility of the patient's body, because greater velocity is obtained, with greater density in the mallet. This depends upon the third law of Newton—that action and reaction are equal and opposite. When a heavy lead mallet is used on a gold filling the force of the mallet is distributed throughout the individual, and at the point of impact the energy applied is lost to a great extent. Although Dr. Stearns is theoretically correct, I do not agree with his assertion that he can use a six or eight ounce lead mallet on soft gold. I demonstrated years ago that the mallet force becomes destructive if used beyond a certain limit, and that limit is passed when the heavy lead mallet is used on soft gold. A thorough condensation is needed in our work, and we must have velocity if we are going to effect condensation at point of impact. Velocity and not weight overcome mobility in the patient. When experimenting years ago, in order to prove the propositions that I thought were correct, I made fillings of tin, cohesive gold, soft gold, etc., in steel matrices, using a great variety of mallets. The finished fillings were then weighed at the U. S. Mint. Perhaps it would have been better to have obtained the specific gravity, but the weight was accurate enough for all practical purposes. I employed various bases, and had, for instance, a soft cushion that I used to represent mobility. Placing the steel matrix upon this, I used various mallets to demonstrate that the force of the blow was distributed throughout the body, and that action and reaction, according to the law of Newton, were not equal in this case. In other words, the coefficient of restitution was low. Then other bases of varying degrees of hardness were taken, and it was demonstrated that the filling packed by hand pressure on a hard base, such as a table, was equal to that packed by mallet force. It was shown that a half-ounce steel hammer on a wood base gave 236½ milligrams in weight, while hand pressure on the same base gave 231½—a trifling difference. It was further demonstrated that the half-ounce steel hammer on a wood base, and the eight ounce lead hammer on a steel base, gave practically the same result in weight by milligrams. In demonstrating the effect of velocity over mobility, I was brought naturally to the then newly invented electric mallet. This, giving from five hundred to one thousand blows per minute, necessarily overcomes mobility upon any base to which it may be applied, as was proven by the fact that it would pack gold on a soft cushion

with the same certainty and the same condensing force as it did on a hard base, and the two fillings were equal within one or two milligrams. At the present time there is no difference between the electric mallet, the mechanical mallet, and all mallets that are used with power in the condensation of gold fillings. I am pleased to see some one taking up this work, and I trust Dr. Stearns will go further with it, and that he will make his experiments so that the whole profession can understand the results without so much theory.

Dr. Stearns, closing discussion: The practical side of this question has been gone over so thoroughly by Dr. Truman and others that I did not think it necessary to touch upon it. In other lines, where mechanics use the hammer, the matter is thoroughly understood. For instance, when the engineer wishes to key up the boxes of his engine he does not take a light steel hammer, but a heavy copper or hide-faced one, because he wishes a tool that will drive the key home and not bruise it. He needs and obtains in this way what we term a swedging blow. A light steel hammer would batter the key all to pieces and still not drive it home. In driving a tent-pin into the ground an ordinary hammer will split it all to pieces, but a heavy maul or axe will bury the pin in the ground without bruising it. Piles are driven with a heavy hammer and short fall, because a light hammer, carried to the height necessary to give sufficient energy to drive the pile, would batter without moving it. There is nothing new in my paper except the differentiation between the qualities of the blow, using the terms "tension" and "volume." The best books and most able writers on this subject make no reference to this distinction, but it is one with which we are all familiar. I shall have to differ with Dr. Truman as regards the use of a heavy mallet for soft gold. What we wish there is a swedging blow, and we do not want to increase the tension. We need something that will penetrate the entire mass and weld it together just the same as we swedge plates. The only difference is, that when using soft gold we have a large number of very thin plates, while when swedging a base for a set of teeth we have only one plate. The action is exactly the same, but in packing cohesive gold it is different. There is no need of discussing further the practical side of the subject, because there is no end to it. If each one will simply stop and think of the use of the hammer in other lines he will have the whole subject at his fingers' ends.

SECTION III.—Continued.

Bleaching Enamel.

PAPER BY JOSEPH HEAD, OF THE SECTION.

The problem of bleaching stains from the substance of enamel has long been of vital interest to the dental profession, for when the decomposed pulp has been removed from a tooth-canal, and the dentinal tubules have been cleansed by peroxid of hydrogen or some other bleaching agent, only too frequently absolute success has been prevented by the fact that the enamel also has been stained.

Internal application or medicaments containing peroxid of hydrogen in these instances might partially affect the enamel in the region of the cervical margin, as at that point a body of dentin is found in sufficient quantity to act as a vehicle for an effective amount of bleaching fluid, but as the cutting edge is approached the dentin gradually disappears, leaving that portion of the enamel without adequate avenues for the application of any bleaching fluid from within. This is a serious objection to any method that depends solely on its ability to bleach through the dentinal tubules, as that portion of the tooth adjacent to the cutting edge is largely composed of enamel, and any process that fails to bleach this stained enamel is of doubtful utility.

The method which I now present has enabled me to permanently bleach the stained enamel of teeth with living pulps, as well as the enamel of pulpless teeth, and since many of my friends who have not seen the results deny that it is possible to bleach the enamel of teeth with living pulps, I thought this subject might be of sufficient interest to arouse discussion and perhaps to admit of a demonstration, if a suitable patient could be found. This method is especially valuable in bleaching the dark, chocolate stains that

occur at times near the cutting edges of the centrals, laterals and cuspids of women, between the ages of twenty and thirty-five. I say women, because this stain does not come from the use of tobacco. It usually appears as a faint yellowish cloud on the enamel surface near the cutting edge. Polishing and superficial grinding do not remove it, and finally if it be allowed to remain undisturbed, it becomes a dark stain that disfigures what would otherwise be an object of beauty. The remedy is so simple that any one of you can readily judge of its efficacy.

The rubber-dam should be applied and the tooth dried with a blast of air as hot as the patient can comfortably bear. Then a thin layer of cotton soaked in twenty-five per cent pyrozone should be laid upon it so that the stained enamel shall be thoroughly soaked. Next a broad, flat, hot instrument should be placed upon the cotton and the steam of the pyrozone driven into the substance of the enamel. A large piece of rubber-dam should be used and oil should be previously rubbed into the hands of the operator, as the steam generated by the hot instrument is caustic. This process should be continued for about ten minutes, when the cotton should be removed and a ball burnisher, hot as the patient can easily bear, should be ironed over the brown stain, driving out of the enamel all of the pyrozone that it has previously absorbed, and also bleaching the stain to an appreciable extent. This process should be continued for an hour, when the patient should be dismissed, being told to return again for other treatments at intervals of not less than two days, in order that the pulp may fully recover from any possible disturbance that the operation may have caused. I mention this purely by way of caution, as no patient of mine has ever complained of anything more than a few insignificant nerve thrills that were cheerfully borne in the light of the great improvement obtained.

Three or four sittings are usually sufficient to give satisfactory results. At the end of the last treatment, instead of pyrozone a concentrated solution of oxalic acid can be used to convert any iron that may have been present in the stain into a white oxalate, just as oxalic acid is employed in bleaching dentin stained with oxyhemoglobin. While the oxalic acid has at times seemed to be useful, in the greater number of instances the twenty-five per cent pyrozone alone has been amply sufficient. This brings me to a very

important question. Whence is the origin of this discoloration? Is it from chromogenic bacteria, is it from the saliva, or does it originate from the partial decomposition of organic material within the enamel structure itself? If the discoloration arises purely from external infiltration the explanation is simple, for the peroxid of hydrogen then soaks in and removes the stain, just as oxalic acid would soak in and remove an ink stain from a piece of chalk. But there are objections to this supposition, inasmuch as no colonies of chromogenic bacteria have been observed in the regions of the stains; and as the stains are local and not general the external infiltration explanation does not seem altogether satisfactory. If, however, the discoloration arises from the decomposition of organic material within the enamel structure the explanation may involve the credibility of the latest theories on the histological structure of the enamel, but this is a question that further research alone can determine.

Discussion. *Dr. H. A. Smith*, Cincinnati: We are indebted to Dr. Head for this simple method of bleaching the external tissue of the teeth. Heretofore our efforts have been confined to changing discolored dentin from within the tooth. It is interesting to study the chemical reaction which occurs in these bleaching processes. It has been stated that the hard tissues of the teeth contain ten per cent of water. By repeated heatings of the enamel as described a proportion of the moisture is removed, and judging by the results obtained the activity of the oxidizing process, whereby the change of color is effected, is greatly increased. It is a question, however, whether absolute dryness of the enamel would not in part defeat the object by preventing the prompt union of the oxygen liberated from the hydrogen dioxid with the discoloring agent of the enamel. Some teeth are "off color" normally, and it would be well to ascertain if this is the case before attempting to bleach. We assume that the normal pigmentation of enamel would not be readily affected, yet the hair is readily bleached by hydrogen dioxid, so why may not the color of the teeth—also dermal appendages—be changed in some degree by an oxidizing bleacher?

Dr. C. L. Goddard, San Francisco: I would ask Dr. Head if he has been able to remove stains from cracks or checks in the enamel or tobacco stains by this method.

Dr. Head: In view of my experience with stains on women's

teeth, I tried the method on men whose teeth were tobacco-stained. One man from some cause or other had a condition of the mouth wherein large portions of the enamel had been dissolved off the teeth, starting from the cervical margin and working towards the cutting edge. One of his front centrals had about half the enamel left, and in it was a deep crack, thoroughly closed but deeply stained, evidently by tobacco. The tooth otherwise was sound, and I concluded to try this method. I had only two opportunities to bleach the tooth, but to my great surprise the first attempt made the stain fade from black to light brown, and the second bleached all the enamel, but did not quite remove the stain from the crack. I am convinced that three or four more efforts would bleach even that remaining line. On incidentally making these applications to the other teeth that were deeply stained by tobacco I found that they also became white and clean. I would urge all of you to try this process on your patients, so that we may report next year just how many and how deep stains can be removed.

SECTION III.—Continued.

Bodies and Color Effects in Porcelain Inlay Work.

PAPER BY W. T. REEVES, OF THE SECTION.

Needless to say, I am an advocate of high-fusing bodies, first, last and all the time. I will not enter into the field of high and low-fusing bodies, for if fully covered it will be enough for a paper in itself. Furthermore, I believe that the literature on porcelain inlays would be advanced if divided into its several fields and treated in separate papers, and the discussion following be confined to the matter presented in the paper, instead of trying to cover the whole ground in one paper and discussion.

Today I wish to present that part of the subject which pertains to obtaining the color desired in the inlay to match the tooth in which it is to be placed. The color of the enamel is practically the same in all mouths. The variations in the color of teeth come in the difference in the bulk, texture and color of the dentin. Therefore it has always seemed to me that an inlay or piece of porcelain that is to be joined to a tooth should be built up in the same manner, that is, made of three or more layers of bodies that are of different color and that fuse at a varying degree of heat, beginning with the highest and finishing with the lowest, so that subsequent bakings will not change what has already been baked, and that liability of disintegration from repeated firings will be reduced to the minimum, for at no time do I carry the baking beyond a good biscuit until the final or enameling layer is put on. This has been my practice in building inlays since 1893, and as our materials and facilities for work have been added to the results have been more and more satisfactory until there is hardly anything to be desired in the way of material.

With all inlays, either large or small, I first bake in the matrix

what I call the foundation, using some high-fusing body, building in as much, allowing for shrinkage, as will leave room for the layers of color and enamel that are to follow, carefully trimming away any excess at the margins so that the layers to follow will be of the same thickness at the joint as at any other point. Upon this foundation I build the colors that the inlay is to be, using strong enough ones to reflect through the final layer or enamel color. In this way you can vary the shade of the inlay at pleasure from the yellowest color at the neck of the tooth to the bluest tip—in fact using all the ranges of color met with in the natural teeth. Upon this I build the final layer, which I call the enamel one, and ninety-nine times out of a hundred it is a very light yellow or greenish tinge, which will modify or subdue the underlying colors so as to give a perfect match of inlay to the teeth.

To inlay workers whose practice has been to take a little of this, that and other bodies, and mix them together until a shade is obtained that is a general match of the tooth, this may seem a radical departure, but by this method I believe the one great thing desired can be produced, a translucent, natural looking imitation of tooth structure; and the more varied the colors in the tooth you are trying to match the more sure you are of obtaining them in this way, for these are underlying colors and not surface ones.

A second advantage is, that you avoid the great bugbear called "the shadow problem," for an inlay built up in this manner, of three or more layers of bodies that are of different color and that fuse at a different degree of heat, will break up the direct absorption and reflection of light rays and will look almost absolutely the same from whatever angle, point of view or distance you look at it. I never mix two or more bodies together to vary the shade of one, for you can get any shade desired of a given body by the thickness of the layer you put on, and a little practice along this line will give you more true artistic ability in producing color effect than all the tabulated proportions of body mixing you can accumulate. One point I want to emphasize, and that is the cultivation of the faculty of looking for underlying colors. A person may have a good eye for a general effect, and be able to select a facing and make a porcelain crown that placed between two natural teeth cannot be detected, yet not be able to match a tooth perfectly with a porcelain inlay because of the failure to see the underlying colors in the tooth;

for if you cut off the corner of either adjoining tooth and cut off the corner of the facing and set against the tooth it would not match at all. I might illustrate this best by citing the case of a dentist who called me in to pass judgment on the color he had selected for three inlays on the labial surface at the cervical margin of two centrals and a lateral. He showed me the color that he thought would be right used over Close body, and I asked him if he did not see a little different underlying color in each tooth—reddish brown in this, gray in that, and still a different color in the other one—and he did not, but he asked me to name off the bodies just as I would use them, and he made a memorandum of the colors and baked his inlays accordingly. I did not see them when finished, but of several dentists who were called in to see the inlays some could not find those underlying colors. He told me afterwards that he could not see them at all, but that the inlays were a perfect match, and he did not think they would have been if he had baked them as first intended.

One other point I wish to bring to your attention—the possibilities there are in the use of what I call primary colors—teeth which at the cutting edge have that steel blue tinge that is so baffling, or those deep gray colors, tobacco-stained teeth, those yellow mottled ones, etc., which when indicated are wanted very badly. I attempted to secure the effect desired with mineral china paints but had very poor results. One manufacturer made up five of these deep colors (that are high-fusing bodies and not mineral paints) to meet my wants. At first I had some difficulty in making a water mixture that would go on smooth and be thin enough, when the inspiration came to grind them up in lavender oil, as china-painters grind their mineral paints, and apply them with a brush, and the result was very satisfactory.

Another thing I wish to say is, that I believe it is a mistake to try to make an inlay in one or two bakings. The objection some might make to my method, that it would take too much time to bake an inlay three, four or five times, is practically done away with now that we have the Hammond furnace, for on an average I can do a baking once in ten minutes. That is, an inlay I bake three times would be finished in half an hour from the time I put it in for the first baking. Some bake in the Hammond furnace faster than that, but competition with time has no place in inlay work.

To Dr. Jenkins of Dresden belongs the credit of arousing the interest of the dental profession to the possibilities of porcelain inlays, but to those who build their work on high-fusing bodies will come the credit of the permanency of porcelain inlays.

All successful inlay workers are enthusiastic, and some will say that an enthusiast cannot see beyond his own horizon; but there is no work in operative dentistry that enthuses a person so much as the successful making and setting of a porcelain inlay, with the consciousness that it is going to give the patient the best service that is possible with any material we now have for restoring decayed tooth structure.

Discussion. *Dr. Joseph Head*, Philadelphia: While heartily commending Dr. Reeves' paper, certain difficulties present themselves to my mind which his process does not seem to have altogether removed. I can see that a layer of yellow approximating the color of the dentin, covered by a layer of porcelain equivalent to the color of the enamel, would greatly assist in giving a lifelike appearance and reproduction of the tooth structure; and if we had an absolutely transparent cement such an inlay should give a perfect match. Unfortunately, however, if the corner of a tooth is broken off, and then cemented on with a nontransparent cement, the color problem still confronts us. While at certain times and in particular positions and from various points of view this corner has a lifelike color, there are other occasions when it does not resemble the original shade of the tooth. All matching is dependent upon two things —the kind and the amount of color. Take for instance a labial cavity. It is with such an inlay that we most often attain almost perfection, not only because the proper color has been chosen, but all the color is reflected directly back to the eye. The tooth is almost always looked at directly from the front, so there is no passage of light into the mouth and no opportunity is given for a shadow to be produced. If, however, we have a moon-shaped cavity on the side of the tooth, involving both enamel walls, the light, instead of being reflected, passes on into the mouth and we have only half of the true color, and therefore a much darker shade. While Dr. Reeves' method will be of much assistance, we can hardly hope to solve the shadow problem until a transparent cement is obtainable.

Dr. C. L. Goddard, San Francisco: I recently hit upon a

method of overcoming one of these disadvantages. In giving a clinic, I noticed that my patient had a large gold filling in a central incisor. The cavity was a mesial one, extending both labially and lingually, one of the kind which will make an inlay show a different color because the rays of light pass entirely through it. I therefore cut out only the anterior portion of the filling, and made an inlay which entirely concealed what was left. The light was reflected directly back from this inlay, not being able to pass through the layer of gold. With all deference to those who were so enthusiastic over high-fusing bodies, I must say that my only experience has been with the Jenkins' bodies, using No. 30 gold for the matrix, and I have been surprisingly successful.

Dr. L. E. Custer, Dayton, O.: The most disappointing feature about porcelain work is, that after you have properly matched the color of the tooth the appearance of the inlay may be spoiled in the setting. If Dr. Reeves' method is practicable it will be a great boon, but I have yet to be convinced that the use of different colored porcelain throughout the body of the inlay will overcome the shadow problem. I should like Dr. Reeves' views on taking an impression and burnishing a platinum matrix into the cavity itself.

Dr. Reeves' closing discussion: I see no occasion for taking an impression of the cavity, but in very deep proximal cavities in molars and bicuspids, running above the gum, I usually take an impression, simply to get the first burnishing of the matrix, so that I may trim it at the cervical margin and not hurt the gum tissue, but I always afterwards burnish it into the cavity. Regardless of criticism, I must say that I have made inlays for all colors of teeth by my method, and have been able to match up the very difficult ones just as satisfactorily as the common shades.

Proposed New Constitution.

The following proposed new Constitution was placed before the Association in regular form by Dr. G. V. Black, and in accordance with the rules will lay over one year and come up for adoption or rejection at the next meeting. This proposed new constitution forms the subject of discussion in the President's Address, which will be found on page 9 of this volume, in which the reasons for the needed changes are fully discussed.

Note.—In this document the principal features of the constitution now in force are retained. The changes made affect especially the plans of work in sections and the formation of the literary program. Material changes are marked "Amended Section," "New Section," "New Article," etc.

PREAMBLE.

We, the members of the American Dental Association and of the Southern Dental Association, do declare ourselves a Society to cultivate the Science of Dentistry, and have adopted the following Constitution and Rules of Order for our government:

CONSTITUTION.

Adopted at Old Point Comfort, August 5, 1897.

ARTICLE I.

NAME.

This organization shall be known by the name of the National Dental Association.

ARTICLE II.

OBJECT.

The object of this Association shall be to cultivate the science and art of dentistry and all its collateral branches, to elevate and sustain the professional character of dentists, to promote among them a mutual improvement, social intercourse and good feeling, and collectively to represent and have cognizance of the common interests of the dental profession.

ARTICLE III.

MEMBERS TO BE OF THREE CLASSES.

SECTION 1. The members of this Association shall be of three classes, viz., permanent, delegate, and honorary members; the two former classes having equal rights and privileges, except that none but permanent members shall be eligible to office.

PERMANENT MEMBERS.

SECTION 2. Permanent members shall consist of those who, coming as delegates and complying with the requirements of the Association, shall sign a statement in a book to be kept for that purpose, signifying to the Treasurer a desire for permanent membership.

DELEGATE MEMBERS.

SECTION 3. All members shall be practitioners of dentistry. They shall be received only from permanently organized state and territorial dental societies. They shall be elected by ballot at some regular meeting of their society, and shall be members who have done some meritorious work for the profession; but no person shall be received as a delegate who is in arrears for dues to this Association.

SECTION 4. Honorary members shall consist of prominent, worthy members of the dental profession residing in foreign countries, who shall be elected by ballot.

SECTION 5. It is hereby specially provided that all persons at present permanent members of the American Dental Association and of the Southern Dental Association are permanent members of this Association, and entitled to all the privileges of the class to which they belong, without further action, and the Treasurer is hereby directed to transcribe their names upon the roll of membership of this Association.

ARTICLE IV.

DELEGATES FROM STATE SOCIETIES.

SECTION 1. Each state society and the societies bearing the names of the territories or other associations of dentists within the sections enumerated in Section 3, Article XII, may send one for every ten of its active members, as delegates to this Association for one year, upon complying with the requirements of its Constitution; but no society shall be entitled to representation that does not accept or substantially recognize the Code of Ethics of this Association.

SECTION 2. Each delegate shall present credentials which shall be approved by the Executive Committee.

SECTION 3. If the Committee on Credentials has knowledge that any applicants for membership are violating the Code of Ethics, said applicants shall not be received, but shall be referred by the committee to the societies whose delegates they are, and in no case shall this Association be compelled

to treat with violations of the Code except the violator is a member of this body and has no membership in any local body.

SECTION 4. This Association will receive no delegates who, since August, 1875, shall have entered the profession without having first graduated at some reputable dental or medical college.

SECTION 5. When any state or territory shall cease to be represented in this Association by delegates properly accredited to it by a regular state or territorial organization or association of dentists for two years the permanent membership of Dentists residing in that state shall cease; Provided this shall not be construed to prevent permanent members of this body from accepting such credentials.

New Section.

ARTICLE V.

SIGNING CONSTITUTION.

SECTION 1. Each new member, before voting or speaking on any subject before the meeting, shall sign this Constitution, inscribing his name and the title of the society from which he receives his appointment. It is expressly agreed by each member in signing this Constitution that he will accept the discipline of a two-thirds vote of this Association.

Amended Section.

DUES.

SECTION 2. The annual dues in this Association shall be five dollars.

DUES—TO BE PAID.

SECTION 3. No member is eligible to office, nor can he speak or vote in this Association, in any of its sections, or in any of its branches, until his annual dues are paid.

DUES—IF UNPAID.

SECTION 4. If the dues of any member remain unpaid for two years his name shall be erased from the list of members of this Association, and his future financial obligations shall cease.

CONDUCT OF MEMBERS.

SECTION 5. Any act of special immorality or unprofessional conduct committed by a member of this Association shall be referred to the Executive Committee, whose duty it shall be to thoroughly examine into the case, and if the charges be sustained, to report to the Executive Council during the annual session at which the charges are preferred. Whereupon, by a vote of the council the offending member may be reprimanded or expelled, a two-thirds vote being required for expulsion, a majority being sufficient for reprimand.

EXPELLED MEMBERS.

SECTION 6. Any member of this Association being expelled or suspended from this society, shall from that date cease to be a member of this body.

RESIGNATION OF MEMBERS.

SECTION 7. Any member not in arrears may offer his resignation, upon the acceptance of which by the council, his membership shall cease; but the Council may at any time thereafter reinstate such member by unanimous consent. In case a member is dropped for non-payment of dues, two years' dues must be paid before reinstatement; nor shall he represent his Society as a delegate until the two years' back dues are paid.

ARTICLE VI.

OFFICERS.

SECTION 1. The officers of this Association shall be a President, three Vice-Presidents, Corresponding Secretary, Recording Secretary, Treasurer, an Executive Committee consisting of nine members, an Executive Council consisting of the President, Secretary, and five members, three Chairmen and three Secretaries of Sections, to be elected as hereinafter provided.

Amended Section.

SECTION 2. Each officer, except as otherwise provided, shall hold his appointment for one year, or until another is elected and qualified to succeed him.

SECTION 3. The President shall be chosen from the division in which the next annual session is to be held, and one of the Vice-Presidents shall be chosen from each division. (See Article XII.)

SECTION 4. At the first election three members of the Executive Committee shall be elected from each division of the country, who shall hold office for one, two and three years, respectively, afterward but one member shall be elected each year from each division, and hold office for three years.

SECTION 5. One member of the Council shall be elected each year from the division in which the newly elected President resides, and two members from each of the others.

Amended Section.

SECTION 6. At the first election after this amendment goes into effect, one chairman and one senior and one junior past chairman for each section shall be elected. Thereafter one Chairman and one Secretary of Sections shall be elected each year from each division, and each Chairman of Sections shall be known as Junior Past Chairman for the first year and as Senior Past Chairman for the second year after the expiration of his time as Chairman.

New Section.

SECTION 7. The names of places for holding the next annual session and the candidates for office shall be nominated by informal ballot of the Association. The three names that are highest, or in case of tie, four names having the greatest number of votes shall be the sole nominees. A formal ballot shall then be taken in which a majority of the ballots cast shall be necessary to a choice. If a choice be not made on the second formal ballot the name of the candidate receiving the fewest votes shall be dropped on the third formal ballot. The informal ballot may be made a formal ballot by a three-fourths

Amended Section.

vote of the Association. Provided that for the re-election of Recording Secretary, Corresponding Secretary, Treasurer and Secretaries of Sections a motion, seconded, that the Recording Secretary, or Treasurer, shall cast the ballot, shall be entertained, but if this fails to carry, nomination shall be made as herein before specified.

ARTICLE VII—Duties of Officers.

DUTIES OF PRESIDENT.

Section 1. The President shall preside according to parliamentary usage as laid down in "Robert's Rules of Order" and the Rules of Order adopted by this Association, and shall present an annual address.

DUTIES OF VICE-PRESIDENT.

Section 2. In the absence of the President, one of the Vice-Presidents shall perform the duties of the office, and in absence of these officers a Chairman pro-tem shall be appointed by the Executive Council

DUTIES OF CORRESPONDING SECRETARY.

Amended Section.

Section 3. The Corresponding Secretary shall attend to the correspondence of the Association with other scientific bodies, when desirable, and with the societies represented in this Association. It shall be his duty to obtain information of and report annually to the Executive Council, and with its approval to this association, an account of the meetings held, the numbers of the membership and attendance, subjects discussed in papers, essays, or otherwise, by the Societies represented in this Association, and such other matters of interest as may be well to incorporate in the proceedings of this body.

DUTIES OF RECORDING SECRETARY.

Amended Section.

Section 4. The Recording Secretary shall keep accurate minutes of the proceedings of the Association, preserve the archives and unpublished documents, and attend to the other duties that pertain to his office. He shall be ex-Officio Chairman of the Publication Committee, and shall see that due notice is given of the time and place of the annual sessions of the Association. He shall be secretary of the Program Committee and see to the preparation and printing for this committee and its distribution to the members of all societies represented in this Association, and shall provide each newly elected official with a correct copy of this constitution.

DUTIES OF TREASURER.

Section 5. The Treasurer shall hold all the moneys belonging to the Association, and shall keep an accurate account as between the Association and its members. He shall furnish bonds satisfactory to the Executive Committee. He shall attend the session of the Executive Committee at 9 a. m. on the first day of the annual session to receive dues, and shall attend at roll-

call to verify the lists of names upon payment of dues within the legal limits, and shall notify all whose names may be erased from the list of membership. He shall pay the drafts of the Secretary, countersigned by the President, and shall report to the Executive Committee, where his accounts shall be audited and by whom his report shall be presented to the Executive Council, together with their own.

SECTION 6. All resolutions appropriating money, except for the legitimate expense of this Association, shall require a two-thirds vote of all the members of the Association present at a general session of an annual session.

ARTICLE VIII.

EXECUTIVE COMMITTEE.

Amended Section.

SECTION 1. The Executive Committee shall be the business committee ad interim of the Association. They shall report to the Executive Council at each annual session under the proper head, their doings for the current year.

SUB-DIVISION OF THE EXECUTIVE COMMITTEE.

SECTION 2. The Executive Committee shall meet after the election of new members to choose their own chairman and secretary, and to divide themselves into three sub-committees as follows, and for the purpose described:

FIRST DIVISION—OF THE EXECUTIVE COMMITTEE.

its chairman.

Amended Section.

SECTION 3. The first division of the Executive Committee shall include It shall act as the Committee of Arrangements, and shall make suitable preparations for the meetings of the Association, consulting with the Program Committee as to its needs. It shall report to the Executive Council at its first meeting of the annual session and with its approval see to the carrying out of the arrangements during the annual session. It shall provide a book for the registration of members or visitors as they arrive; and it shall be their further duty to secure from the Treasurer a good and sufficient bond.

SECOND DIVISION—CREDENTIALS AND AUDITING COMMITTEE.

Amended Section.

SECTION 4. The second division of the Executive Committee shall act as the committee on registration, and shall meet for that purpose at 8 a. m. on the first day of the annual session. They shall examine and verify the qualifications of members, including all violations of the code of ethics and the Constitution. They shall register the names of members or visitors as they arrive, with place of their residence and hotel address, and give them all necessary information regarding the arrangements for the meetings, the literary programme, and arrangements for entertainment, if any. They shall also act as the auditing committee for the year.

THIRD DIVISION—COMMITTEE ON VOLUNTEER ESSAYS.

SECTION 5. It shall be the duty of the Third Division to examine all essays, papers or reports that may be referred to it by the executive council before presentation to the Association and to report to the Executive Council their approval or disapproval of such essays, papers or reports in whole or in any particular parts to the end that the time of the Association may not be occupied by reading of irrelevant, unimportant, or improper matter.

Amended Section.

REPORTS OF SUB-COMMITTEE.

SECTION 6. Each of these sub-committees shall report from time to time, as may be necessary, to the Executive Committee as a whole, who shall decide upon such report, if possible; but in case of their inability to decide upon any matter, it shall be brought before the Executive Council for its decision.

MEETINGS OF EXECUTIVE COMMITTEE.

SECTION 7. The Executive Committee shall, if possible, meet for consultation and arrangement of their respective duties on the day preceding the annual session of the Association. The Chairman may at his discretion summon the members thereof to a meeting for consultation or making reports, at any suitable hour during the annual session of the Association, and at any other time at the request of five members of the committee.

Amended Section.

ARTICLE IX.

EXECUTIVE COUNCIL.

SECTION 1. The Executive Council shall be the business head of the Association during its annual session and when it deems it necessary, have charge of all of its business matters whatever; and it will be its duty to take cognizance of the doings of any and all of its officers, see to the smooth working of all of its parts, and attend to all matters referred to it.

New Section.

SECTION 2. The Executive Council shall meet at nine o'clock on the day of the first meeting of each annual session, to receive the reports of committees and afterward by adjournment or at the call of the presiding officers and committees, for the transaction of other business of the Association.

SECTION 3. All matters not otherwise specially provided for shall be referred to the Executive Council without debate.

SECTION 4. The Executive Council shall report to the Association at each general session the results of their proceedings for ratification or rejection without debate.

SECTION 5. Five members of the Council shall constitute a quorum for the transaction of business.

SECTION 6. All meetings of the Council shall be public; the time and place for which shall be posted for information of the members. Members may be heard on any matter before the Council.

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ARTICLE X.

LOCAL COMMITTEE OF ARRANGEMENTS.

SECTION 1. There shall be appointed by the President, annually, a committee of three, residing at or near the place selected for the next meeting, whose duty it shall be to assist the Executive Committee to procure rooms for meetings, and make such other local arrangements as may be neeeded for the Association.

VACANCIES.

SECTION 2. In case vacancies occur in the Committees or Officers of this Association by reason of absence from the Annual Session or otherwise, such vacancies shall be filled by appointment *pro tempore* by the President.

PUBLICATION COMMITTEE—HOW APPOINTED.

Amended Section

SECTION 3. The President shall appoint two members of this Association who shall act in conjunction with the Recording Secretary as the Publication Committee. The Committee shall be authorized to employ a sufficient number of competent reporters to furnish an accurate report of the proceedings of each meeting of sections, and of each general session.

ARTICLE XI.

INSTRUCTIONS TO THE PUBLICATION COMMITTEE.

SECTION 1. The Publication Committee shall superintend the publication and distribution of such portions of the transactions as the Executive Council may direct, or the Committee judge to be of sufficient value.

Slight Amendment

They shall specify in the annual report of this Committee the character and cost of the publications of the Association during the year, to whom they are distributed, and the number of copies still on hand.

SECTION 2. Any report or other paper, to be entitled to publication in the volume of transactions for the year in which it shall be presented to the Association, must be placed in the hands of the Publication Committee in typewritten form within twenty days after the close of the annual session; and must also be so prepared that the proof sheets furnished the authors shall be returned to the Committee without material alteration or addition.

SECTION 3. Every paper received and accepted by this Association, and all plates or other means of illustration, shall be considered the property of the Association, so far as may be necessary for the publication in the transactions of this body.

DISCLAIMER.

SECTION 4. The Publication Committee is hereby instructed to print at the beginning of each volume of the transactions the following disclaimer, viz.: "The National Dental Association although formally accepting and pub-

lishing the reports of the various sections, and the essays read before the Association, holds itself wholly irresponsible for the opinions, theories or criticisms therein contained, except when otherwise decided by special resolution."

ARTICLE XII.

SECTION 1. For the purpose of this Association, the United States shall be divided into three divisions, to be called the East, the South and the West

The East shall include New England, New York, New Jersey, Pennsylvania, Ohio, Indiana, lower peninsula of Michigan and Ontario.

The South shall include Delaware, Maryland, District of Columbia, Virginia, North Carolina, South Carolina, West Virginia, Georgia, Florida, Alabama, Mississippi, Louisiana, Texas, Kentucky, Tennessee, Arkansas, Oklahoma and Indian Territory.

The West shall include Illinois, Missouri, Wisconsin, upper peninsula of Michigan, Minnesota, Iowa, North Dakota, South Dakota, Nebraska, Kansas, Montana, Wyoming, Colorado, Idaho, Utah, Washington, Oregon, Nevada, California, Arizona, New Mexico and Alaska.

PLACE OF MEETING.

Amended to Special Time only.

SECTION 2. The place of holding the next Annual Session shall be determined each year by ballot of the Association at its Annual Session, in the general session of the third day, except that the place of meeting shall be in the West in 1898, in the East in 1899, and in the South in 1900, and thereafter in the order named, meeting in each section every third year.

ARTICLE XIII.

ORGANIZATION OF SECTIONS.

New Article Abolishing the Old one Except Sections 2, 3, 4, & 7.

SECTION 1. This Association shall be divided into three sections, as follows:

The first section shall have charge of prosthetic dentistry, crown and bridge work, orthodontia, metallurgy, chemistry, and allied subjects.

The second section shall have charge of operative dentistry, nomenclature, literature, dental education, and allied subjects.

The third section shall have charge of oral surgery, anatomy, physiology, histology, pathology, etiology, hygiene, prophylaxis, materia medica, and allied subjects.

SECTION 2. It shall be the duty of each member to identify himself with one or more of the above-named sections, and he shall inform the Recording Secretary of his choice at the time of joining the Association.

SECTION 3. The Secretary shall assign members to the sections in which they are expected to work if they shall fail to make their own choice before the close of the general session of the second day of the Annual Session.

SECTION 4. It shall be the duty of the Recording Secretary to keep a list

of the members of the sections and to furnish copies of the same to the Officers of the sections.

SECTION 5. The Chairman of each section shall preside at all of its meetings; shall exercise general supervision over its business, and shall see that the labors of his section are so conducted as to secure the best results. In the absence of the Chairman the senior or junior past Chairman shall preside. (See Article VI, Section 6.)

SECTION 6. The Secretary of each section shall keep full and accurate records of the doings of his section, shall have charge of the stenographic reports, and report the same to the Recording Secretary each day, as soon as possible after their approval by his section.

SECTION 7. For the information of all members a list of the names of members of sections shall be published in the transactions of each year.

ARTICLE XIV.

MEETINGS.

New Article Complete. Abolishing The Old.

SECTION 1. The meetings of this Association shall be known as annual sessions, general sessions, and meetings of sections.

SECTION 2. The annual sessions shall begin on the first Tuesday in August of each year and continue four days.

SECTION 3. The general sessions shall be meetings of the whole membership in attendance upon the annual session and shall be held as follows:

The first general session shall convene at 10 o'clock on the first day and shall stand adjourned at one P. M. unless adjourned earlier. During this session the functions appropriate to the opening of the annual session may be performed, and the annual address of the President delivered.

On the second, third and fourth days the Association shall convene in general session at twelve o'clock, noon, and stand adjourned at thirty minutes past one, unless adjourned sooner.

SECTION 4. In the general sessions any member may introduce matters of business, if seconded, which must then be referred to the Executive Council without debate, provided that any member, opposed to such matter of business or motion, with a second, may call for a vote on such reference. A vote shall then be taken without debate, and if decided in the negative, that shall dispose of the matter for that annual session.

SECTION 5. The general session shall receive reports from the Executive Council as the first order of business, after the reading of the minutes, and shall approve or annul any matter of business or motion referred to it by the Executive Council by vote without debate.

SECTION 6. The election of officers of the Association shall be held at the general session of the third day of the annual session, and newly elected officers presiding over the general session shall be installed at the close of the general session on the fourth day, and those presiding over meetings

of each section at the close of the last meeting of the section during the annual session.

SECTION 7. At the second and fourth general session there may be presented such addresses or reports as may be determined by the Programme Committee with the approval of the Executive Council, but these shall in no case occupy more than one hour of the general session.

SECTION 8. Sections 1, 2, and 3 shall each meet in separate rooms at 2:30 o'clock on the first day of the annual session for the reading and discussion of such essays, papers, reports, or for clinics, as may be determined upon by the Programme Committee with the approval of the Executive Council. Thereafter similar meetings of each section shall be held at 9 A. M. and 2:30 P. M. each day of the annual session. Evening meetings of the sections may be held as determined by each section.

SECTION 9. No business of any kind not strictly pertaining to the proper carrying out of the literary, scientific or clinical work of the sections shall be introduced or considered in the meetings of the sections.

ARTICLE XV.

PROGRAMME COMMITTEE.

New Article Complete.

SECTION 1. The Committee on Programme shall consist of the President, Secretary, the Chairmen of sections, and the two last past Chairmen of sections. It shall be the duty of this Programme Committee to keep close watch over the progress of dental science and literature and to arrange with competent persons in the profession who are members of this Association, or with persons of known ability in closely allied subjects in science not members, to prepare and read or to discuss essays, papers, contributions, or perform such clinical demonstrations as will tend to the improvement of dentistry. It shall report to the Chairman of the Executive Committee what special preparations may be needed for carrying out the programme that may be arranged or contemplated.

SECTION 2. The senior past Chairman, junior past Chairman and Chairman of each section shall, subject to the Committee, act as a Sub-committee, having especial charge of the programme of that section, the responsibility in this work being in the order named.

SECTION 3. The President of the Association shall be President of the Programme Committee, or when present shall preside over meetings of a Sub-committee. The preparation of the programme for the general sessions shall be under his charge. In meetings of the Programme Committee in the absence of the President, the senior past Chairman of sections present shall preside, seniority beginning with the division in which the President resides and following the order of rotation.

SECTION 4. The Recording Secretary shall act as the Secretary of the Programme Committee and shall have charge of the preparation, printing and the distribution of the programmes. He shall announce at each general ses-

sion the arrangement of the programme for the next general session; and also the programme for each of the sections for the next twenty-four hours.

SECTION 5. The Programme Committee shall meet for consultation regarding the next year's work as soon as possible after the election of Officers, and hold such meetings thereafter on the call of the President or Secretary as may be deemed necessary to the efficient carrying out of the work.

SECTION 6. The Programme Committee shall report to the Executive Council at its first meeting on the morning of the first day of the annual session the programme arranged for approval, and thereafter shall hold such meetings as may be necessary to arrange from day to day for the smooth working of the presentation and discussion of the matter of the programme in the general sessions and meetings of sections.

ARTICLE XVI.

QUORUM.

Twenty members shall constitute a quorum in this Association.

ARTICLE XVII.

SUSPENSION OF RULES—THREE-FOURTHS TO VOTE.

The regular order of business may be temporarily suspended by a three-fourths vote of all the members present, for the consideration of a specific subject, upon the completion of which the regular order shall be at once resumed.

ARTICLE XVIII.

BRANCHES.

SECTION 1. For the wider diffusion of the benefits of this Association, the members of each division may form themselves into one or more separate bodies, to be styled "Branches."

POWERS AND OBLIGATIONS.

SECTION 2. Branches shall have such powers and privileges, and be subjected to such obligations, as shall be determined upon from time to time by the National Association in annual session.

SECTION 3. Each Branch shall be free to hold meetings and to govern itself as its members shall think fit, but no Branch law shall be valid which, in the opinion of the National Association, may contravene any fundamental law of the Association.

SECTION 4. Each Branch shall pay its own expenses, and no Branch shall be deemed for any purpose the agent of the Association, or have power to incur any obligation in its behalf.

SECTION 5. Each Branch shall furnish a copy of its proceedings, including papers and discussions, for publication with the transactions of the National Association.

SECTION 6. Each Branch may receive delegates from societies within

its division upon the same conditions as the National Association, and such delegates shall have the same standing in the National Association as though admitted directly from the state societies.

DUES.

SECTION 7. The annual dues of members attending the Branches shall be paid to the Branch Treasurer. Two-fifths of the dues may be retained for the benefit of the Branch. The remaining three-fifths shall be paid over to the Treasurer of the National Association.

SECTION 8. The annual session of any Branch shall be omitted whenever the annual session of the National Association shall be held in its division.

ORDER OF BUSINESS.

FIRST DAY.

8 A. M.—Meeting of the Executive Committee.
8 A. M.—Meeting of the Programme Committee.
9 A. M.—Meeting of the Executive Council.
10 A. M.—Meeting of General Session.
Report of Executive Council.
Report on Programme for next general session and for each section for next 24 hours.
President's Address.
1 P. M.—Adjournment of general session, unless sooner adjourned.
2:30 P. M.—Meetings of sections for literary and scientific work.
8 P. M.—Meetings of sections for literary and scientific work.

SECOND DAY.

9 A. M.—Meetings of sections for literary and scientific work.
12 Noon—Meeting in general session.
Reading Minutes.
Report of Executive Council.
Report on Programme.
Address, or Reports.
2:30 P. M.—Meetings of sections for literary and scientific work.
8 P. M.—Meetings of sections for literary and scientific work.

THIRD DAY.

9 A. M.—Meetings of sections for literary and scientific work.
12 Noon.—Meeting in General Session.
Reading Minutes.
Report of Executive Council.
Report on Programme.
Selection of next place of meeting.
Election of Officers.

1:30 P. M.—Adjournment if not adjourned earlier.
2:30 P. M.—Meeting of sections for literary and scientific work.
8 P. M.—Meeting of sections for literary and scientific work.

FOURTH DAY.

9 A. M.—Meeting of sections for literary and scientific work.

12 Noon.—Meeting in General Sessions.
Reading of minutes.
Report of Executive Council.
Address, or Reports.
Installation of Officers.
Appointment of Committees.
Final Reading of Minutes.
Adjournment of the Annual Session.

AMENDMENTS.

The Constitution, Rules of Order, and Order of Business of this Association may be altered or amended at any annual session by unanimous consent of the members present, providing notice has been given in writing at a previous meeting of the annual session at which the amendment is proposed; or by a vote of two-thirds of the members present, providing notice of the alteration or amendment has been given in writing at a previous annual session.

MINUTES OF THE FIFTH ANNUAL MEETING

OF

THE NATIONAL DENTAL ASSOCIATION,

HELD AT

Milwaukee, Wis., August, 1901.

FIRST DAY—MORNING SESSION.

FIRST session, Tuesday, August 6, was called to order by the President, Dr. G. V. Black of Chicago, at 11 o'clock.

Prayer was offered by Dr. Edmund Noyes of Chicago.

Dr. H. J. Burkhart, Batavia, N. Y., presented the following report from the Executive Council :

The Executive Council has received the report of the Executive Committee concerning the preliminary and other arrangements for this meeting and recommends its adoption. Recommends ratification of action of the President in inviting Dr. J. H. Worman, U. S. Consul, and Dr. J. S. Marshall, as representative of the Army and Navy Board, and that they be granted the privileges of the floor.

The following program is recommended for this morning's session:

Prayer.

Address of Welcome, by the Mayor.

Response, by Dr. C. N. Johnson.

President's Annual Address.

That the minutes of the last annual meeting, held at Old Point Comfort, Va., be approved.

That a general session be held Wednesday afternoon, commencing at 2 o'clock, and that the clinics be held Thursday afternoon at 2 o'clock.

On motion, the report was concurred in.

Dr. G. V. I. Brown of Milwaukee made an address of welcome.

The response to the address of welcome was made by Dr. C. N. Johnson of Chicago.

Dr. M. F. Finley, Vice-President for the South, was called to the chair, when the President, Dr. G. V. Black, read his annual address.

On motion, the address of the President was referred to a special committee of three for consideration, said committee consisting of Drs. Jonathan Taft, H. W. Morgan and James Truman.

Dr. J. D. Patterson of Kansas City, Mo., Chairman of the Executive Committee, made an announcement regarding the meeting of Sections for the afternoon.

The Secretary made an announcement regarding the Executive Council meetings, also concerning voluntary essays.

Dr. G. V. I. Brown made an announcement regarding the registration of members.

On motion, the Sections were directed to meet at 3 o'clock in the afternoon.

The order of business being completed, the Association adjourned to meet at 8 p. m.

FIRST DAY—EVENING SESSION.

Tuesday evening session was called to order by the President at 8 o'clock.

Dr. H. J. Burkhart read the report of the Executive Council.

The Executive Council reports as follows:

Recommends—That all speakers opening discussions be limited to ten minutes, and all succeeding speakers to five minutes.

That report of Committee on Army and Navy be read by Dr. Wms. Donnally, Secretary.

That all papers presented to Sections become the property of the Association.

Program for this evening—Report of Dr. J. D. Patterson, Chairman of Section IV, and Paper by Dr. C. L. Hungerford.

On motion, the report was concurred in.

The report from the Committee on Army and Navy Legislation was read by Dr. M. F. Finley, Chairman.

Dr. J. D. Patterson read his report as Chairman of Section IV.

Report of Chairman of Section IV.

In noting late investigations and observations in the subjects of this section we naturally turn first to the consideration of caries of the teeth, that universally prevalent disease which introduces the greatest number of dental disorders, and inquire if there is additional light upon its etiology. After the researches of Professor Miller of Berlin, whose conclusions have been most universally accepted, the discovery of the "gelatinous placques" by Black and Williams engrossed the attention of those interested in the etiology of caries. These placques have been discussed at length in dental literature, and the place claimed for them as factors in dental caries is well understood, so in this report we shall look for more recently promulgated knowledge about caries. One of the most important articles on this subject was brought forward at the recent International Congress at Paris, where an author of renown, Dr. Michaels of Paris, in making a report upon an extensive study of the saliva, claimed "That the saliva like all recrementitious secretions is liable to physiological oscillation in constant relation to the changes in the humors of the body." Connecting this study with caries of the teeth, these conclusions with others are reached: 1. "The saliva contains definite chemical principles which arrest or retard the progress of dental caries (sulfocyanid of ammonia)." 2. "The alkaline sulfocyanids arrest the formation of putrefactive fermentation." 3. "Chemically dental caries is a disease of demineralization, due to the presence of an excess of acid principles in the saliva having a greater chemical affinity for the constituents of the tooth." 4. "The chemical affinity of potassium and sodium is greater than that of the earthy alkaline bases in combination with acid salts." 5. "Lactic acid possesses a greater affinity for calcium than does carbonic acid." 6. "Active dental caries characterizes the hyperacid diathesis." 7. "Diathetic dental caries (present with gout and diabetes) results from lactic acid fermentations."

In 1900 Dr. Michaels said upon the same subject: "My investigations of saliva compel me to recognize other causes than microorganisms for dental caries. The chemical influence of the saliva is undeniable, as can be proved by any physiologist or chemist who will respect my observations. The objections of certain authors,

who deny that saliva contains acid enough to produce appreciable effects, seems to me to rest either upon experimental errors or upon lack of reflection. Various medicines introduced into the body reappear in the saliva—iodids, for instance, occur as alkaline iodids, bromids act similarly, mercury also, in short, one may justly conclude that active glands absorb, secrete and excrete other things than their normal products. No matter how feeble the dissolved chemical element may be, if it have affinity for a base there is a reaction. These reactions may be more manifest or less, that is merely a question of the proportions present and the length of contact." In discussion of Dr. Michael's paper Dr. Leon Frey said: "The study of the chemistry of the saliva is an entirely new thing and has begun now just as the study of the blood, urine, etc., began years ago. * * * The physician studies the urine. Now the dentist will study the saliva and they will both see the relation between the different phenomena."

At the same session of the Congress Dr. Frey said: "The question of the etiology of dental caries, after having been considered solved, has again become the subject of important discussions. This discussion began on account of the contradictory views of Galippe on the one side and of Black and Williams on the other." Dr. Frey tabulated the etiology of dental caries as follows: 1. General Predisposing Causes. 2. Local Predisposing Causes. 3. Occasional Predisposing Causes. 4. Efficient Predisposing Causes.

In this tabulation a number of microbes are given as causing caries. In discussion Dr. Chouet, who is a well known investigator on the subject, stated: "*I am totally convinced that specific microbes of dental caries do not exist*, and the reason is because the beginning of dental caries consists in the decalcification of the enamel." Continuing, he said repeatedly and emphatically: "*This disorder (caries) can be produced by any of the ordinary mouth microorganisms.*" Concluding, he said: "I am convinced, and next year I expect to be able to scientifically demonstrate, that *dental caries can be produced by any common species of microorganisms.*" These statements will be of exceeding interest to many teachers who have labored to inculcate into the minds of their students the idea that a specific microorganism must precede tooth caries.

It must be said, however, that while Dr. Miller was no doubt

largely instrumental in giving out the theory of a specific microorganism for caries in earlier investigations, in his later writing he admits having observed four varieties of microbes either of which may be responsible. The positive and sweeping statement of Chouet, however, that any sort of a microbe will produce caries, is certainly an advanced belief, and on account of his prominence commands our attention. Opposing this statement of Dr. Chouet is the recent enunciation of another prominent author, Kenneth W. Goadby of London, who says: "We must in the first place guard against the supposition advanced by some, that all organisms are capable of acid production under favorable conditions."

A recent notable article by Dr. Miller deals with the claims of Dr. Palmer and others, that recurrent caries is due to electrical currents, satisfactorily proving that recurrent caries originates just as the primary form does.

Prominent in importance while under the head of etiology must come a consideration of hygienic measures for prevention of caries, therefore another subject of this section, *Hygiene*, will engage brief attention. In an article by Dr. M. H. Fletcher of Cincinnati, entitled "Alkaline Saliva," he claims that if the saliva were continuously alkaline, as in normal conditions, caries would be prevented. That an alkaline fluid is therefore needed at the "portal" of the body for protection; and thus, if saliva is kept alkaline in excess of normal, many of the acid-forming fermentative and putrefactive processes are prevented in the mouth; and that saliva being swallowed in this purer state assists digestion instead of interfering with it. Dr. Fletcher gives the following powder which he claims will meet the conditions and be preventive of tooth caries—Pulverized Cereal, 75 per cent; Sodium Borate, 17½ per cent; Potassium Chlorate, 7½ per cent; Orris and Menthol for flavor, Sugar to sweeten. Dr. Fletcher claims that five grains of the powder are sufficient to keep the saliva alkaline for some time after using. The pulverized cereal is used instead of chalk, pumice, or cuttlefish bone, as the abrasive quality which is contained in most powders, and which is injurious, is thus lessened. These claims are placed before the National Dental Association for consideration, for if well founded they are surely valuable in the prevention of dental disease.

In an article by Dr. G. V. I. Brown of Milwaukee on Prophylaxis (DENTAL DIGEST) he calls attention to the superficial char-

acter of mouth sterilization in the following words: "Based upon a series of experiments testing the efficacy as a mouth-wash of hydrogen dioxid (Oakland), as compared with a 5 per cent solution of carbolic acid and a one in two thousand solution of bichlorid of mercury, I have to offer the following conclusions—Carbolic acid and bichlorid solutions held in the mouth come into contact with only those germs that are superficially located, and destroy them. When a deeper scraping is taken a growth is easily attained, therefore sterilization is incomplete. When hydrogen dioxid is used it oxidizes the organic deposits about the teeth, loosens up the secretions about the gums, and sets free germs that were at first inaccessible to the action of the carbolic acid and bichlorid solutions. If after the germs have been thus set free carbolic acid or bichlorid solution or further quantities of hydrogen dioxid be used, the most desirable state of asepsis is obtained."

An article in the *British Dental Journal* by Dr. J. Douglas Logan, Edinburg, contains the following: "Having thus far discussed the matter of caries in relation to health, and the condition of the oral cavity generally in relation to the dental organs, we may now ask wherein lies the cause of this appalling destruction of teeth, and verily, the answer in not difficult to find. The question must be entirely one of hygiene—what has been done with so much success in the treatment of zymotic diseases, namely, perfect sanitation, free access of pure atmospheric air and careful dieting, or, in other words, an improved condition of the surroundings of the patient, is precisely what is required in regard to the teeth if they are to be maintained in a satisfactory state of health." Dr. Logan almost entirely ignores predisposition and constitutional dyscrasia as factors in caries of the teeth.

At the Paris Congress Dr. Ernest Jessen of Strasburg read a paper upon "Instruction of the Public in Regard to the Value of Dental Treatment in Relation to General Health,"in which he used these pregnant words: "It is evident, and we can never repeat it too often, that this enormous propagation of caries of the teeth in all classes of people ruins the health of the individual and constitutes a great danger to the general health. * * * From the mouth these microorganisms can penetrate to the interior of the cranium, into the salivary glands, lungs, and even into the general circulation. Even in the mouth accumulations of bacteria often

cause inflammations which can become serious. Miller says that as much attention should be paid to the mouth in cases of digestive trouble as to the diseased stomach. Want of appetite, bad taste in the mouth, and especially fetor of breath, that are supposed to originate in the stomach, are caused only by a neglected and unclean condition of the mouth. These statements prove to us that the masses of bacteria found in unclean mouths, independent of those introduced with the food and beverages, are sufficient to provoke fermentations and chronic dyspepsia of the stomach. * * * Bacteria of diphtheria have been discovered in the mouth of a healthy child. The bacteria are only waiting for certain favorable conditions in order to produce their specific effect. Even the agent of pneumonia is found very often in the saliva of healthy people. The infections caused by bacteria from the atmosphere or from contact with infected objects are favored by the unhygienic condition of the mouth. In consequence, one of the most important preservative measures during an epidemic consists of giving to the mouth the kind of care required by the particular case." Dr. Jessen in concluding strenuously argued that dentistry should be a factor in popular and public hygiene.

The attention of this Association is respectfully called to the advocacy of inspection by dentists of the mouths of children at public schools, which in the discussion of Dr. Jessen's paper was advised especially by Dr. Bonnard of Paris. Dr. Bonnard thought this inspection should be made four times a year. Is not such a move possible in America, and is it not superior to the often advocated method of lectures to teachers and pupils in our schools?

Upon the subject of the "Etiology of Adenoids," J. Wright, M.D., recently had a valuable article in the *Brooklyn Medical Journal.* Of interest from a dental standpoint are the following conclusions: "This brings me to the etiology, which perhaps is more open to discussion than any other part of this much-discussed subject, and that is, the relation of the shape of the upper jaw to the presence of the lymphoid tissue in the pharyngeal vault. A number of years ago it was universally acknowledged that a jaw presenting a high buccal arch was usually, if not always, the result of post-nasal obstruction. This I have always believed to be erroneous. No one has ever been able to explain satisfactorily the rationale of it; it is certainly not, as some have said, by the rarefaction of the pharyn-

geal air. That of course takes place on inspiration, but it takes place below the adenoids and should produce scoliosis of the vertebræ or collapse of the oropharynx and trachea. The open mouth, the lower jaw dragging on the sheath muscles, has been said to approximate the alveolar arches by pulling them down and so inward, as would elastic bands. Neither clinical observation nor anatomical facts bear out any such theory, plausible though it seems."

An extremely interesting article by E. B. Dench, M.D., *Cosmos*, November, 1900, upon "Reflex Aural Symptoms Dependent upon Dental Caries," is recommended for careful reading. The closing words to his medical confreres are as follows: "I wish again to emphasize the importance of a thorough examination of the teeth, not only in all cases of otalgia not due to acute inflammatory conditions in the external or middle ear, but also in cases of tinnitus aurium, or of progressive impairment of audition in which the pathological factor is obscure."

"Diseases of the Eye in Relation to Diseases of the Teeth," by E. W. Stevens, M.D., Denver, is another recent able article showing how many diseases of the teeth affect the visual organs. The author strenuously advocates examination of the teeth by an expert dentist in all cases of painful or inflammatory conditions of the eye.

Dr. Leon Frey of Paris read a paper before the International Dental Congress, 1900, upon "Chemical Erosion of the Teeth." In regard to its etiology he said: "The question is still in obscurity." Among the predisposing causes he thinks arthritism is of capital importance.

Every member of the profession must be interested in the etiology of sensitive dentin, that bugbear of the operator in nearly every day of his practice. Dr. A. Gysi of Zurich read a paper at the International Congress upon this subject. His theory of its cause is as follows: "Probably you know the physical phenomenon of the incompressibility of water or of substances rich in water. If pressure is applied against one end of a tube which is filled with water the pressure is directly transmitted to the other end. The dentin is traversed by a great number of canaliculi, which are filled with a substance or protoplasm which serves for the nutrition of dentin, and is very rich in water (about 80 per cent), and which behaves like pure water and is incompressible. When pressure is exercised in a carious cavity with an instrument the pressure is directly trans-

mitted through the semi-liquid contents to the odontoblasts, which are the center of the true sensitiveness of the dentin."

Etiology of Pyorrhea Alveolaris. Since the uric acid diathesis was by a few investigators declared to be the causation of the disease known as pyorrhea, there have been other and later hypotheses of its etiology. The one that seems at present to be gaining in popularity is, that the disease is caused by a specific microorganism, and when this is isolated and an agent for its destruction found, cures will be effected and not before. For those who are so prone to magnify pyorrhea into a specific trouble we do not invite sympathy, but instead ask all to follow the clearly laid down and simple effects of local irritation and environment, accentuated by the malnutrition found in many constitutional conditions.

Those who are concerned about the microbic cause of pyorrhea have recently the following sage advice from Dr. Williams—"The tendency with the pathologist, who is chiefly concerned to find a specific cause for his disease, to regard every separate form of microorganism which appears constant under a single method of cultivation as a distinct species, is perhaps quite natural, but there is not room enough for the truth in any theory which is not large enough to contain all the facts. The problem of the pleomorphism of fungi is intimately associated with their methods of reproduction."

We respectfully direct the attention of those who without any proof claim a microbic origin of this disease to the difficulties surrounding the isolation and proving of a particular microorganism as a cause of inflammatory conditions in the oral mucous membrane. Those who trippingly say that pyorrhea is no doubt due to a specific microbe will cause the life-long investigators in the biology of bacteria to smile at the ignorance and credulity of those who unthinkingly make and second the statement. Experiments so far are negative. They will doubtless so remain.

Dr. G. Lenox Curtis of New York, in an article entitled, "Syphilitic Loculosis Alveolaris" (pyorrhea alveolaris), claims that real pyorrhea is always caused by syphilis. With true bohemianism he volunteers the statement that "Only recurring cases are worthy of the appellation—Pyorrhea Alveolaris." Further he says: "So confident do I feel that my views are correct that I now treat all cases of this kind with antisyphilitic remedies, and I find that a

large percentage of them are benefitted. In several cases I have been misled and diagnosed suppurative gingivitis as pyorrhea alveolaris. This I did because I could not find the egg-skin eschar, etc." By the way, this "eggskin eschar" apparently (?) discovered by Dr. Curtis is claimed as distinctly diagnostic and the reader is led to believe that if there is no "eggskin eschar" there can be no syphilis. Verily, a new syphilographer has appeared on the horzion. One more quotation: "In 1890 I had an opportunity to study blood, and then it was that I became convinced that the usual method of physiological study of this pabulum was inadequate. I now believe the blood carries with it the active principles of most if not all diseases." Dr. Curtis will do well if he heeds a reminder of famous pathologists, namely, that "Both syphilis and other bodily taints can never be ignored in the treatment of nearly all diseases incident to middle or later life." The same is true of the uric acid diathesis, but to claim that all cases of pyorrhea are caused by either the syphilitic taint, the presence of uric acid, or a particular and specific microbe, is an astonishing statement to the pathologist and to the great majority of laymen in the field of etiology and pathology.

In an article by Rickman Godlee, M. S. Eng., the author directs attention to some of the surgical complications of pyorrhea alveolaris and cites cases which had been diagnosed as—"Pleurisy, followed by empyema;" "Pleurisy, followed by bronchitis, symptoms of carcinoma of stomach, and mercurial salivation." Upon treatment for pyorrhea which was found present every symptom of empyema, pleurisy, carcinoma of stomach, and salivation disappeared without other than local treatment. Dr. Godlee concludes his article as follows: "Some hold that pyorrhea depends upon the presence of some special microorganism, but the accuracy of this statement has not yet been established, and considering the large number and great variety of organisms always present in the mouth, it may be assumed that the proposition will be a difficult one to prove. It need not be added that when the pockets are once formed their contents teem with many kinds of bacteria."

Mr. Henry Sewill of England recently says in *British Dental Journal:* "In a large number of cases of pyorrhea there is a singular absence of caries, and the teeth are often of the best structural character. It occurs in many instances in patients whose care

of the teeth amounts to fastidiousness. The malady is extremely chronic, many months elapsing before each affected tooth is shed. The disease starts in one or two teeth and gradually affects others not necessarily adjacent, until in the end the whole set becomes involved. Of the etiology of pyorrhea virtually nothing is known. It is always attended by or associated with disturbances of the general health, and to this dental disease beyond all others it would be most reasonable to ascribe the systemic effect leading to the form of anemia so graphically described by Dr. Hunter."

Let us devote a few minutes to the consideration of the term so frequently heard of late, namely, "True pyorrhea," a term, by the way, we think "Cut to suit the imagination but not the fact." A term indicative of a condition of inflammation and phagadena in the oral tissues where the operator failed to effect benefit or cure on account of lack of skill, or because tissue destruction had progressed beyond hope of saving even by the highest skill the dental organs thereto attached, and so for convenience it was called "True pyorrhea." To our mind it is begging the question and is an excuse for the limitations of the operator either in knowledge or skill. If there can with scientific accuracy be a condition of true pyorrhea, there should naturally be a false pyorrhea; logically both names are anachronous. As well might the course of infectious disease at its advanced and fatal stages be called true pyemia, but in the earlier and curable stages be given another name. Pyorrhea has an infinite variety of changes from inception to the exfoliation of the teeth, but to denominate the incurable stages only as pyorrhea and arising from a different source *per se* than the earlier stages, is a sort of pathology and etiology unscientific and misleading.

Dr. B. F. Arrington of Goldsboro, N. C., recently says upon this point: "There is but one form of the disease, but there are sundry features that present as the disease progresses. I speak positively and pointedly upon this subject, for such are my convictions, established through practice and watchful observation, and I feel assured that investigation and time will confirm the verity of my assertions. All classes and grades of society are subject to it, and it seems to be on the increase. * * * It is not dependent upon any particular state of the system for origin, for all alike, the robust and the feeble, seem to be equally subject to it; nor is it a consequence of any other disease. It is always perceptible first at the margin of the gums,

develops more and more plainly, with diagnostic features, and progresses (let the general state of the system be what it may) stage by stage, with features never varying, developing until it stops with destruction of the alveolar process and loss of the teeth."

Dr. Barrett, in his late edition of "Oral Pathology and Practice," again promulgates what we consider a positive misconception of pyorrhea in its various stages. On p. 144 he says: "*True pyorrhea should be a specific, pathologic condition.* The term itself, while expressive of our present knowledge, is too broad, covering altogether too much, for there are many exudations of pus from the alveolar walls that are easily explainable and of very simple origin. But until its exact nature is distinctly marked out and all its phenomena comprehended we must recognize at least three separate pathological degenerations that are covered by the term and which without doubt are often confounded with each other."

In this quotation Dr. Barrett seems so overanxious about making out three kinds of pyorrhea that he starts out by imploring his readers to believe that "*True pyorrhea should be a manifestation of some distinct specific pathologic condition.*" The words indicate that the author speaks without proof and without positive belief. Now let us for a moment inquire why "we must recognize three separate pathologic degenerations" in pyorrhea alveolaris. So far as the etymology and plain meaning of the name are concerned they do not ask us to do so. The name simply signifies—*A flow of pus from the alveolar region*—a condition, if you please, not necessarily specific. As Dr. Arrington says, it has its inception, "develops more and more plainly, with diagnostic features, and progresses stage by stage, developing until it stops with destruction of the alveolar process and loss of the teeth." Again, the so-called three kinds of pyorrhea all yield *positively* to the same treatment if sufficient unaffected normal tissue remains, namely, *surgical removal of every local irritant and the establishment of an absolute hygienic condition.* We respectfully submit then, that in the consideration of this disease misleading terms and divisions should not be taught in text-books.

Discussion. *Dr. C. N. Peirce*, Philadelphia: From some of the quotations in the report we are led to believe that dental caries is due to microorganisms in the secretions. It has not as yet been settled just what part is played by germs, and while there is no

doubt that they exist in the mouth at all times, they do not always have an affect on the teeth. We must therefore believe that there are predisposing causes which enable them to make inroads upon the hard tissues. It is doubtless true that the enamel is first affected, but no one has ever attempted to explain how that takes place, except to say that it is through decalcification. This is simply taking out the lime and leaving the organic matter. Then the inroads are made upon the tubular tissue of the teeth, and there we have the action of the microorganisms which not only decalcify the tooth but also disorganize the organic matter, and in that disorganization we have decay. We can place a tooth in an acid solution and decalcify it thoroughly and yet have no decay, so the germs evidently play a part in disorganization of the organic matter.

Attention should be called to a fact which you all know, namely, that decay occurs most readily between the ages of seven and twenty. During that period the inorganic matter of the system is being employed in building up the hard tissues, so there is not the surplus which there is in later years to counteract the acidity which we may have in the mouth. Every dentist knows that the progress of decay is coincident with the formation of the hard tissues, and that it is largely retarded after they are fully formed, so age has much to do with the progress of decay. After the tissues are formed we have a deposit of tartar or hard salivary calculus in the mouth, which rarely comes in early life, and when it is present in any considerable degree the progress of decay is much modified. It may occur between the teeth and in places where the brush and antiseptic cannot reach, but not to the same extent as before, so I state positively that the absence or presence of salivary calculus is an important factor in determining whether decay is progressing rapidly or slowly. I believe every one should use an antiseptic mouth wash, one that is anti-acid and that will correct the formation of acids in the mouth arising from whatever condition.

Concerning pyorrhea, you all know that the term used is simply the name of a symptom, for pyorrhea indicates merely that we have pus in the alveolar socket. Now, I understand from Dr. Patterson's statement that he believes it to be quite inconsistent with truth to speak of true and false pyorrhea. I have used these terms re-

peatedly, because they are the best I could think of to distinguish between one condition due to local and one to constitutional symptoms—the first cured by local treatment and the second by constitutional. The former condition may be present constantly. Every dentist at times finds pus in the alveolar socket which is occasioned by local irritation, and which can be cured by topical application, so I should not call it true pyorrhea. This latter is a form of disease that cannot be cured by local application, requiring systemic treatment as well. I have always had a number of cases of pyorrhea under my charge, where the patients for years relied entirely upon diet and systemic treatment for the modification of the disease, and they have all been benefited thereby. Dr. Patterson is mistaken when he states that pyorrhea commences wholly at the gingival border, for the disease may have existed for months or years before we see that local manifestation and the appearance of pus. The trouble has been progressing from the apex of the root, where it most often starts. I know cases where this disorder has been in a family for three generations. Years ago, before I thought it possible to do anything for the disease, an elderly man came to me. I examined his mouth and predicted that he would lose all his teeth within a year, which proved true. His son afterwards came into my hands with a splendid set of teeth. I noticed a tendency to congestion in the periosteum of the root, which I modified by local and constitutional treatment. On one occasion, however, I found a small cavity between the molars, which was inaccessible without wedging, but so soon as the wedge was put between the teeth I discovered pyorrhea of the worst type around both molars, so I removed the wedge and filled the tooth. Constitutional treatment caused the pyorrhea to subside, and the patient now has not only those molars but has never lost a tooth, yet I can induce pyorrhea in any one of his teeth by the slightest irritation at the root. This is constitutional pyorrhea, because of his systemic condition, and if that condition were not present the disorder could not be brought on. That is true pyorrhea, and true pyorrhea is only constitutional and can be cured by nothing but constitutional treatment.

Dr. W. C. Barrett, Buffalo: The point concerning the influence of microorganisms especially engages my attention. This was the problem of the ages until Dr. Miller solved it. I believe he thought at the outset that none but acid-producing organisms would induce

caries, but my impression is that he has modified his views and now believes that a much wider class of germs can produce it. That is, that under certain conditions a nonpathogenic organism may become pathogenic; that the character of a germ may materially change through its developmental progress and the influence of the media in which it is proliferated. If such is the case it broadens the field of influence of microorganisms in dental caries.

It is the reproach of dentistry that the disease which causes the most trouble is the least understood. Many men offer theories, but few prove them, and of the many hypotheses advanced not one has been absolutely demonstrated. We do know one thing, that pyorrhea is a disease of the pericementum, but we have not completely solved the question of its true etiology. We also know that it is a degenerative disturbance undoubtedly due to some metabolic changes that occur locally or in the general condition. If the disease consists of a general pathologic disturbance we have one series of symptoms which have been called true pyorrhea. As the essayist stated, that term assumes that there is such a thing as false pyorrhea, but we must make a distinction in some way. It seems indisputable that there are certain general changes which induce one line of symptoms, and there are changes restricted to tissues or organs which produce another line. I will stop talking, because I doubt if any discussion on general grounds teaches us very much about this mysterious disease.

Dr. E. S. Talbot, Chicago: I am much surprised at this late day to hear pyorrhea alveolaris spoken of as a disease entity and not a stage of infection. Disease of the gums and alveolar process is frequently of years standing, and yet no pus is noticed in the mouth. Indeed, a person may lose the entire set of teeth without the appearance of pus. Inflammatory conditions of the alveolus may exist without pus infection. This inflammatory process may be deep-seated or local, so I have substituted the term "Interstitial gingivitis." In this a local cause may produce the gingivitis which extends into the alveolar process. In the constitutional form of the disease it becomes interstitial in character, that is, deep-seated, and the alveolar process may or may not be involved. The inflammation which results from moving teeth in correcting irregularities, and the absorption of the alveolar process after a tooth has been extracted, should not be spoken of as pyor-

rhea alveolaris—the inflammatory process is deep-seated and interstitial in character. Any irritation will produce gingivitis, which invariably becomes interstitial, and no one can say where one leaves off and the other begins. Dr. Barrett does not believe it possible for anyone to detect experimentally the operation of constitutional causes, but I do. I subjected several healthy young dogs to mercury in different methods, and in a week or two they were killed. An examination of the arteries in the alveolar process and the peridental membrane was made under the microscope, and the inflammatory process just beginning, as the result of mercurial poisoning, was clearly evident. There are many causes of this disease. Any systemic condition will produce the interstitial variety if the eliminating organs of the body are not in good condition. The most marked effects of the disorder are noticed in the soldiers in the Philippines, for after they have been there about two years the teeth of many of them loosen and drop out. On the other hand, men working 6500 meters above the level of the sea in a cold climate suffer with the same disease. In both cases it is nothing but interstitial gingivitis which eventually becomes pyorrhea alveolaris. As a result of these extremes of temperature the eliminating organs do not do their work. In the hot climate, while the soldiers do perspire, insensible perspiration is checked, the kidneys become clogged up, respiration is interfered with and autointoxication occurs. In the high cold climate the lungs are interfered with, the skin contracts, perspiration does not take place, so the kidneys undertake the work of the skin and lungs with the same result. In scurvy and in mercurial poisoning there is also autointoxication, and the gums and breath of a man suffering from Bright's disease indicate how far it has progressed. Autointoxication is merely self-poisoning. The blood becomes poisoned, irritation of the inner alveolar capillaries starts up, and an obliteration of the arteries of the alveolar process results. Interstitial gingivitis is due to autointoxication, and it makes no difference what the cause is. It may be due to typhoid, pregnancy, in fact, any condition which interferes with the work of the eliminating organs produces irritation and contraction of the capillaries and inflammation long before pus infection occurs. If the mouth be perfectly healthy pus infection will not take place, but if the mouth be not healthy the pus germs present affect the tissues, abscesses form and pus flows to

the surface. There is only one kind of pyorrhea and one type of pus. In cases where a deposit occurs upon the roots of the teeth it is caused by a stasis of the blood due to obliteration of the arteries of the alveolar process. Absorption is going on and the deposit which results is nothing more nor less than the absorbed alveolar process which is deposited on the necks of the teeth.

On motion, the privileges of the floor were extended to all present during the evening.

Discussion of Dr. Patterson's report was opened by Dr. Jonathan Taft, and was continued by Drs. W. C. Barrett, E. S. Talbot and J. S. Marshall. The discussion was closed by Dr. Patterson.

Dr. C. L. Hungerford of Kansas City, Mo., read his paper. Subject: "An Inquiry into the Etiology of Disease."

The discussion was opened by Dr. James Truman, and continued by Drs. E. T. Darby, Morris Albrecht, J. W. Cormany, Wm. Crenshaw, G. V. I. Brown and J. N. Crouse. The essayist closed the discussion.

Dr. H. J. Burkhart presented a supplementary report from the Executive Council.

The Executive Council reports as follows:

Recommends—That the program for Wednesday morning session begin with Section V.

Report of Dr. W. C. Barrett, Chairman.

Papers by Drs. George W. Cook, A. H. Thompson and T. L. Gilmer.

That table clinics be on exhibition at all times when general body is not in session.

On motion, the report was concurred in.

On motion, the Association adjourned to meet Wednesday at 9 a. m.

SECOND DAY—MORNING SESSION.

Wednesday morning session was called to order by the President at 10 o'clock.

The President announced the appointment of Drs. W. C. Bar-

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rett and M. F. Finley to present Dr. J. H. Worman, U. S. Consul, at 11 o'clock.

Dr. W. C. Barrett of Buffalo, Chairman of Section V, presented his report.

Report of Chairman of Section V.

PATHOLOGY is year by year receiving greater attention, and the schools are widely enlarging their instruction. It is only recently that this subject has been accorded its proper position by being made a separate study, and by having a distinct course of lectures devoted to it. Formerly it was incidental to the chair of Operative Dentistry, the professor giving a limited amount of instruction in the treatment of alveolar abscess, general odontalgia and a few like conditions. This can be fully justified only upon the theory that dentistry is wholly mechanical, and that the treatment of oral diseases falls within the province of the medical man. There are even yet few schools which have a separate chair of Pathology and Oral Practice, the instruction in the treatment of pathological conditions being given by either the teacher of Operative Dentistry or of Therapeutics. The better schools, however, are constantly striving to bring about the broadening both of the instruction in and practice of dentistry, and to qualify their graduates for something aside from the expert handling of mechanical tools.

The drift of medicine, as its practitioners become better acquainted with the nature of diseased conditions, is towards its division into specialties, one lifetime not being sufficient, as formerly, to master the whole general field. It appears inevitable that, if dentistry is to fulfill its whole mission, its practitioners must be made competent to take entire charge of every pathologic condition connected with the oral cavity, or any of the sinuses that communicate with it. When that day shall come, degenerations of the nasal sinus, the pharynx, the maxillary sinus, and of all the tissues in relation, will be referred to the competent dentist, just as at present diseases of the eye and the ear are placed in charge of the oculist and aurist. When this becomes an established fact the oral

practitioner will occupy a better position in the public estimation, while his emoluments will be greatly increased and abundance of room will be afforded for the new men entering the profession. But this cannot be attained until graduates are properly instructed in the principles involved in such practice, and are made competent to diagnose and prescribe intelligently for such diseased conditions. Hence the necessity for a broad curriculum in our schools.

Pyorrhea Alveolaris.—It is not greatly to our credit as practitioners that there should be such a diversity of opinion concerning a disease that is responsible for the loss of more teeth than any other —pyorrhea alveolaris. Although many hypotheses have been advanced, none has been very widely accepted, and to-day we know very little more of it than that it is a degenerative condition of the pericementum, that it assumes different types, and under certain conditions and in certain instances is amenable to a treatment which is totally inadequate in other cases. It is true that some are very positive concerning the correctness of their pet hypothesis, but others are quite as certain that it is false. Certain practitioners claim infallible success for a special method of practice which in other hands is a failure. Our professional history in relation to this condition is but a repetition of that in some others, like pulp-capping. Favorable cases can be infallibly cured by the means which as invariably fail in those which are unfavorable. There is abundant room for further study and experiment, and the man who completely solves the problem will win as undying fame as did he who determined the exact nature of dental caries.

The discussion was opened by Dr. Thomas Fillebrown, and continued by Drs. James Truman, S. H. Guilford, G. V. Black, (Vice-President Finley called to the chair), C. N. Peirce, E. C. French, C. L. Hungerford and J. S. Marshall, discussion being closed by Dr. Barrett.

Dr. W. H. G. Logan, Secretary pro tem of Section V, read his report.

Report of Meeting of Section V.

MEETING called to order by Dr. W. C. Barrett. On motion of Dr. Fillebrown, Secretary pro tem W. H. G. Logan was elected Secretary of Section. Upon motion, and after thorough consideration and discussion, the following papers were recommended to the Council to be read before the main body:

Paper, "Method of Attachment in Implantations," by Dr. W. C. Barrett.

Paper, "Diagnosis and Surgical Treatment of Empyema of the Maxillary Sinus," illustrated with lantern slides, by Dr. W. H. G. Logan.

Paper, "Odontomes," illustrated with lantern slides, by Dr. T. L. Gilmer.

Paper, "Pathology in Dental Practice," by Dr. Geo. W. Cook.

Dr. A. H. Thompson's paper, "Evolution of the Premolars," to be read by title before the main body, unless time permits of the consideration of the summary of two pages.

W. H. G. LOGAN, Secretary.

Dr. H. J. Burkhart presented report from Executive Council.

The Executive Council reports as follows:

Recommends—That Dr. John S. Marshall's paper be made a special order for 10 o'clock, and then continue with papers of Section V.

On motion, report was concurred in.

Dr. Geo. W. Cook, Chicago, read his paper. Subject, "Pathology in Dental Practice."

On motion the discussion was postponed to a later session.

Dr. J. H. Worman, Consul to Munich, was introduced and spoke on the fraudulent issuing of American diplomas to foreigners.

MR. PRESIDENT, LADIES AND GENTLEMEN: All that I have done, I have done as an American citizen, for the country we love, whose reputation we should always cherish. I ask no praise for myself; no other comment upon my work than a hearty response to and support to the finish of the task in which I am engaged. (Applause.)

The American dental profession is a profession worthy to be honored.

There was a time when American dentists were the pride of this nation at home and abroad. A newspaper may now and then facetiously comment upon this or that particular effort of the man who is called a dental surgeon, or in plain English, a dentist, but he is one of the skilled artisans of this nation. He has done perhaps more than any other man to attest to the peculiar fitness of Americans to stand out on the face of the earth as men of industry, skill and thought. You are not the stupid workmen who go about a task simply for the purpose of accomplishing a task. You have ingenuity in everything that you touch. You have thought in everything to which you apply your deft fingers. From the time that the American dentist began his work to the present hour he has striven to raise the dignity of his profession, and I am here, a simple American citizen, for the moment, and that with pride, in the employ of the United States Government, seeking to honor in you, your American genius, and that is all. (Applause.)

American dentistry is only in its childhood. I know something of its development, having studied it within the last eighteen months to my heart's content from within and from without, in my bedroom and in my parlor, at my dinner table and at my evening meal, and I presume the next place where I shall study it will be in the jail. (Laughter.)

I know how your honored profession began and how its colleges came into existence, and what has been accomplished to the present, and as a layman yield to no one in the pride that I take in fostering the work of this noble profession.

I have not come, however, to give you a Fourth of July ovation, neither have I come in here simply to bestow words of praise. I have come to tell you that from the crown of my head to the sole of my foot—I do not want you to mistake which sole I mean—I am simply enlisted to rid you of the shame that has been allowed to be fastened upon you, a national disgrace of which we all must free ourselves. I know the machinations, the dangers and the disgrace of the nefarious traffic which has been carried on. I know it better than you do. You may think you have given much of your time and thought to this subject. You have not learned more than the A of the alphabet. Not one of you, no matter how well informed, has any conception of what has been going on, what evils and wrongs have been perpetrated, at home and abroad, in the name of American dentistry.

I want you to bear with me for a few moments this morning while I disclose some facts to you, so that you may go away more earnestly enlisted in the service and more determined than you now possibly can be to hold up my hands, to hold up the hands which are fighting this nefarious traffic, so that American dentistry may be honored the world over as it was in its foundation and as it must be as long as the name of "America" is attached to it. (Applause.) I know it will cost you a little time and patience. It will cost me more than this.

My experience this week reminds me of the man who was traveling in a mountainous country, who had looked at the mountains from afar, and then had been taken up to their very tops—to the peaks. I have been to see the

National Dental Examiners. They constitute the foreground of the country. Then I went to see the National Association of Dental Faculties; they seem to me the mountain peaks. Now I have come into the valleys. I am at last to find out whether it is worth while to take possession of this land or whether I shall go back to Moses and tell him that we will not go in and own the land. All will evidently depend on you, the great body of your profession—the National Dental Association.

As you know to your sorrow, certain colleges in this country have attempted to sell degrees abroad by offering to graduate students in less than the time allotted by the curriculum. These colleges have hesitated at no step by which they could convince soulless people in Europe that it is possible to gain such honors without making regular effort in time and expenditure. By simply sending money across the ocean people in Europe, as ambitious as incompetent, have thus been able to obtain American diplomas. They have even obtained licenses as dentists from the National Board of Dental Examiners in a certain state—I do not say which one, nor that it was done to-day, yesterday or last week—but it has been done, and, believe me, it was the certificate alone of the State Board of Dental Examiners, with the great seal of the state attached, that gave attestations to diplomas that otherwise would have proven entirely worthless in the country for which they were imported. No German court would have ever given credence to documents from American dental colleges, so low have they come to think of them, had it not been for those state attestations. They look upon our institutions as private enterprises, like stock companies. They do not understand the purposes of institutions, the beneficiaries of private gifts for public good, supported by men willing to make any sacrifice in order to better this nation. That is a thing they cannot understand in Europe, where the state organizes and directs everything. So these diplomas have come not to have the worth of the paper or parchment on which they are printed, if it were not for the attestations given by the great seal of the state. I am here to tell you that such fraudulent attestations have been given, and that they are in my possession.

In pressing these offences home to you, I have waited for the moment when I could bring this evidence. Now, if I cannot get your support, the support of the profession, yea, if I cannot get the support of the American people and your demand of the authorities of the states involved that they shall wipe out this shame, then all the work that I have done in the last eighteen months, night and day, at the noon hour and midnight hour, will be wasted. I want you to pledge yourselves here to-day that you will back me up, not simply by sending me all kinds of congratulatory enconiums—I cannot win on those—but by giving me the support of the authorities that can end this evil. I want you to remove from me personally the stigma that my purposes are not sincere—honest.

I have stood before the great men of an empire, before the chief justice of the state in which I am accredited, before the prime minister of the kingdom to which I am accredited, before the President of the Bundesrath,

which is the body that makes the laws for the entire empire of Germany, and I have told them one and all that we are an honest people and that we mean what we say. (Applause.) But upon my brow I shall wear the brand of liar, if I am not able to bring about that which I have promised. I told them that these things would be undone as soon as I came to bring the wrongs to the notice of my people, and it is now eighteen months since I began this strife, and it is not yet undone.

A year ago last June I was promised that if I would furnish evidence, these offenders should be brought to justice. I have furnished such evidence. I have brought more and in abundance with me. Now, do not blame me if I speak feelingly. I have no political ends to gain, no office to acquire. The little that I have I am perfectly willing to lose if I can save your honor. (Applause.) You must not simply endorse the work done for you; you must demand of the proper authorities that they act. You must provide the means with which to furnish counsel. As I said to the other body yesterday, I have spent between two and three thousand dollars of my own substance—I have spent that money in typewriting, in the employment of counsel, in telegrams, in travel, and in every other imaginable way, for I have to pay these expenses, as the United States Government has no such provisions. I have spent my money freely and without a word of plaint, and I have not come here to-day to ask you in good old Methodist fashion, to take up a collection for me. I have come for no such purpose. I want it to be on record that there are men in the service of the United States Government who have some nobler ambition than simply to draw their salaries. (Applause.)

There has been more and better work done by the present administration to ennoble the Government service and to uplift the standard than you can dream of. There is coming to be throughout the entire service, through the agency of the men who are at the helm, a feeling of rivalry to do that which shall give the world, to which we have gone out since the changes that have come over our nation by the war with Spain, the impression that we are not only a mighty people, and that we will demonstrate whenever the time calls for it, but that we are also an honest people, and that we mean to do by every man on the face of the earth that which is just. Now, I want you to see that you have money in your purse, that your officers have money in their purse, so that a poor consul who it striving to save the repute of any institution may not be told by them that they have not the time, are too much worn by the demands upon them, can give neither their personal assistance nor that of counsel, and that such the consul must get himself, four, five or six thousand miles away. Should you place any one fighting for you in that position? Fill your treasuries, spend all the money that it requires, no matter how much. Stop the evil and root it out forever. (Applause.)

It may interest you in this connection to know that I have been threatened with a libel suit by an institution in Chicago for what I have said and written as a United States officer, who, of course, under the law is exempt.

The complaint is that I have declared that that institution had issued diplomas to people who have not complied with the requirements as published by that institution, and that certifications in the form of licenses have been issued by the State Board of Illinois attesting to the capacity of these students as dentists and dental surgeons in order that, if any government of Europe should refuse to accept an institution upon which the brand of shame had been put by the consul, the presentation of the great seal of a mighty state might save such institution the disgrace of seeing its diplomas thrown out of court.

I am quite willing to accept a summons, to be arrested either here or in Chicago or anywhere else, to be taken before the courts and to answer for this great crime which I have committed by bringing these facts to the light of day. (Applause.) I am only going to stop speaking and writing against these things when I may be sure that it will be sung in my requiem that it was I who ended the shame. (Applause.)

I have before me here circulars with which I am not going to worry you by reading them, but I will give them to the papers. (Cries of Read!" "Read!")

"Well, then, if you insist that I continue, I will read the letter I received from the State Department, showing with what readiness it has supported me:

'Referring to your unnumbered dispatch of April 21, 1900, in regard to two institutions in the state of Illinois which are said to bestow the degree of Doctor of Dental Surgery without regard to qualifications or fitness of the graduate, I now enclose for your information copy of letter from the Governor of Illinois in which he states that he has been unable to secure any satisfactory evidence bearing upon the subject of such fraudulent diplomas. The Governor adds that he would be pleased to receive any information of a positive nature which would enable the authorities of the state to prosecute such frauds."

I want that to go on record, what I have read of this dispatch. Now you will kindly frame your resolutions upon it. There, I think, I have accomplished one thing. You have asked me to read this, and it is now a part of your proceedings.

There are diplomatic ways sometimes that are past finding out. (Applause and laughter.) If I had not used a little of this American horse sense and a little of our specific kind of diplomacy, which is strictly American, and which is not to be had on the other side in the same unadulterated form, I would not have succeeded in obtaining those papers. (Pointing to a bundle of papers.)

I have referred to state attestations. Look at this photographic reproduction in full of a license issued by the State Board of Dental Examiners of Illinois. It lacks the signature of one man whom I have the honor to see in the audience. (Applause.) I beg Dr. Reid to come up here. (Dr. Reid rose and was greeted with applause.) You may have many other honest officials in Illinois, but I tell you right here and now if it had not been for that

man I would have been paralyzed in my endeavors. (Applause.) It is his integrity and his determination to support the right, regardless of consequences, straight, frank and square, that has made my success possible. I tell you, in these days of political corruption, when so much is charged by one party against another, when you find an American who is worthy to bear the name of an honest man, crown him. (Applause.) That is the kind of royalty we have. We do not want any better, and I say all honor to Dr. J. G. Reid. He is melted to tears now. I tell you, I feel proud of him, and I know you do. It is a pleasure to meet such a man.

From Munich I had written letters upon letters and sheets upon sheets until it seemed as if I would weary in the attempt, and for eight long months I could not get a line of evidence in confirmation of that which I had in my own hands, and until I could get some one to say that these things were on the records of the state to which they belonged, I was powerless, for the thieves could take those records and destroy them, and the officers who had been guilty of wrong could put them away, and render me helpless—powerless, as I said a moment ago. That man saved me. (Applause.) In saving me, he saved you.

I have here another paper of this sort, an exact duplicate of the paper that I showed you before, a license of the state of Illinois, with its seal, bearing the signature of three officers, which may be fraudulent or true. I have asked the officers to give me over their signatures a statement whether they had issued these licenses or not. I have yet to have an answer from J. H. Smyser. (Hisses.) That gentleman may be absolutely innocent of issuing these papers, but I tell you, if I stood accused of anything that was not within the line of right, you would not find me waiting months without giving an answer to my government and my people. (Applause.) I could not let the sun go down upon me. I should not want to go out and look men in the face until I had cleared my skirts from such possible disgrace. (Applause.)

The issuing of a license is a very small thing, but when it is issued with a certain number and another duplicate is issued three hundred numbers ahead on the same day, when it is physically impossible for any man or any body of men to examine such number of candidates or even issue the licenses in one single day, it does not seem to me it would take twelve months for me to say I never signed that paper. (Applause.) The fact is the men of Chicago never dreamed that I would ever get these licenses into my possession. They never dreamed I would get photographic reproductions, for it is the law of Germany, and they know it better than you do and better than I did—for I had to learn the tricks in the trade, as I was not in the diploma-mill business—that the German government never gives out of its hands any evidence that it holds in criminal proceedings. But I got these papers. There are moments of desperation when a man feels that he will not suffer himself to be called a liar, and if he has got fighting blood in him and does not carry a revolver always in his pocket, and does not think it wise to shoot down the man who will put that stamp upon his brow, he is bound to fight in some way

to satisfy himself and the others that he did not deserve that shame. I used desperate methods, and I got these papers. (Applause.)

If I were to go on in detail, you would have to sit here all night, and that I do not want you to do. I have evidence enough in my office to cover these tables and pile it up as high as my head. I have over forty fraudulently issued certifications in my possession, by photographic reproduction, and I have not only those, but I have actually succeeded in bringing three originals. (Applause.)

I am not going to read anything more, but I want you to know that it is possible for an institution existing in this country to send out all over Europe a scurrilous circular like the one I have here under date of March, 1901. You shall have it in print and read it in the papers. I venture to say that very few copies of this have ever seen the light of day in this country or have ever come into the possession of any man in the employ of the Government except myself. When I received the circular, I recognized the fact that the United States mail had been used for its transmission, and that there is a law beyond the law of libel for him who uses the United States mail for fraudulent purposes, and that possibly the very man who wants to take me for libel ought to be taken by the officers of the law for crime. This circular I am going to publish. I want you to read it. The newspapers will gladly take it, I know. I want you to read also the circular dated June, 1901. I have it here, both in the original and in the translation, and I want you to see that on the back of this I have the authority of the highest court of Germany and that in spite of the fact, as I tell you, that although by your delays in punishing the guilty you have caused these men to doubt my sincerity, I have, nevertheless, enjoyed the distinction of having these men confiding in me, not in me plain James H. Worman, but in me the United States Consul, the honored representative of the greatest nation on earth. (Applause.)

I wished to get this paper into my hands that I might substantiate the facts concerning it. This circular issued from the German-American Dental College in Chicago asserts, under the signature and attestations of a notary public of the state of Illinois, that the Board of Dental Examiners of the state of Illinois have declared on a certain date the school in question to be a reputable school worthy of confidence and support and everywhere acceptable as reputable so that the German government may accept its diplomas and permit the students to assume the title of D. D. S. Now, it so happens that the minutes record something very different from that, and that if I were to give you all the details connected with that record before and since, you would realize what wrongs are being committed against you even now. But I have in my possession to-day, although Dr. Reid does not know it, the very minute-book of the Illinois Board of Dental Examiners. (Applause.) And to-morrow morning Dr. Reid will have to open up a new book, for he will be keeping the new records, and I the old. (Laughter.) Henceforth neither Dr. Reid nor any other man is responsible for them. I am. You

see that when I make a fight, I fight to the finish. You sometimes have to bring up a column that has not been looked for in order to win a battle. They had to do that at Waterloo. You remember how the English troops were crowded by Napoleon when Blucher came out of the forest. Well, I'll bring up the reinforcements for this fight to the finish. (Laughter.)

The question is, are you willing to see to it that if it costs $10,000, $20,000 or $50,000, and yea, if you have to make the greatest sacrifice that you have ever made, even have to go as a profession and beg for the money of your wealthy patients, are you willing to end this disgrace and to give such unworthy officials to understand that no money on earth and no power on earth can stop you in bringing to justice the guilty and in bringing about the triumph of the right? (Applause.)

On motion a committee of three was appointed to prepare suitable resolutions regarding the work of Dr. Worman and report to this body at the evening session.

The subject was discussed by Drs. Barrett and Bogue.

Committee appointed by the President consisted of Drs. C. N. Johnson, James Truman and J. Y. Crawford.

On motion, Association adjourned to meet at 2 p. m.

SECOND DAY--AFTERNOON SESSION.

Wednesday afternoon session was called to order by the President at 2:45 o'clock.

The discussion of Dr. Cook's paper was taken up and was opened by Dr. W. H. Whitslar and was closed by the essayist.

Dr. John S. Marshall read his paper. Subject, "Army and Navy Dental Corps."

The times and places for the meeting of various Sections for purposes of organization were announced.

The discussion of Dr. Marshall's paper was opened by Dr. B. Holly Smith.

On motion, further discussion of Dr. Marshall's paper was postponed to the evening session.

A resolution was presented to the effect that the Secretary write the Surgeon-general that it is the sense of this Association that no men should be admitted to the Army and Navy Dental Corps except those having received the endorsement of their local or state society.

On motion, resolution was adopted.

On motion, Association adjourned to meet at 8 o'clock at the Pfister Hotel.

SECOND DAY—EVENING SESSION.

Wednesday evening session was called to order by the President at 8:30 o'clock.

Discussion of Dr. Marshall's paper was continued by Drs. Wms. Donnally, James Truman and R. T. Oliver. The essayist closed the discussion.

On motion, a vote of thanks was extended to the Army and Navy Examining Board for the good work they had done.

Dr. A. H. Thompson's paper was read by the title and directed printed in the transactions.

Dr. W. H. G. Logan of Chicago read his paper. Subject, "Diagnosis and Surgical Treatment of Empyema of the Maxillary Sinus." Illustrated with lantern slides.

The discussion was opened by Dr. G. V. I. Brown and continued by Drs. T. L. Gilmer, C. P. Pruyn, Geo. W. Cook, W. C. Barrett, L. E. Custer and C. L. Hungerford. The essayist closed the discussion.

On motion, the Association adjourned to meet at 9 o'clock Thursday morning.

THIRD DAY—MORNING SESSION.

Thursday morning session was called to order by the President at 9 o'clock.

The following resolutions were read and adopted:

Resolved, That a vote of commendation and thanks be given to the members of the Dental Examining Board of the Army for the faithful and efficient manner in which they have undertaken the arduous duties imposed upon them. With an assurance of the confidence of this, the National Dental Association, that through their efforts the dental profession of the United States will be well and creditably represented, and the most efficient service secured in this branch of the service.

The motion was carried unanimously by a rising vote amid cheers and general enthusiasm

Dr. C. N. Johnson, Chairman of the Committee appointed to suggest ways and means to assist Dr. Worman's operations in Europe against the diploma traffic, presented the following report:

Your Committee respectfully beg leave to report that we fully endorse the efforts of Consul Worman in this direction, and feel that every effort of this Association be put forth to raise the necessary means for the prosecution of these violators of the law in the State of Illinois or elsewhere, and for the accomplishment of this object we would recommend:

First. That the National Dental Association appropriate a sum not to exceed one thousand dollars ($1,000) to be placed in the hands of the Treasurer of this Association for the purpose, subject to the order of the President and Secretary.

Second. That the societies affiliated with this body be requested to subscribe to this fund, and that the representatives of the various local societies be urged to bring the matter before the societies of which they are members.

Third. That the National Dental Association desires to express its cordial thanks to U. S. Consul Worman for his untiring efforts and unselfish sacrifices for the preservation of the good name of the dental profession of America.

Fourth. And further that the thanks of this Association be expressed to the Government at Washington and the State Department for its liberality and encouragement to Consul Worman in the prosecution of its work.

Fifth—That these resolutions be transcribed, and a copy presented to Consul Worman and also one forwarded to the State Department at Washington.

Sixth—That copies of these resolutions be forwarded to the Governor and State authorities of Illinois, showing our condemnation of the illegitimate traffic in diplomas abroad.

C. N. JOHNSON,
JAMES TRUMAN,
J. Y. CRAWFORD, *Committee.*

The resolutions with the following amendment were adopted:

Amendment—That the amount to be appropriated by the Association should be left to the discretion of the Executive Council.

On motion, a committee conisting of Drs. H. J. Burkhart, C. N. Johnson, and A. R. Melendy, was appointed to take charge of this work.

The Secretary then read a letter from Mrs. Geo. H. Cushing, and also one from Dr. H. W. Lubben of Galveston, Texas.

DEAR MR. MORGAN: TROPICO, CAL., Aug. 4, 1900.

Yours with check from the National Association was received last evening, and I hasten to acknowledge the same, as the letter has been delayed by many forwardings. It is two years since we left Florence, and we have moved three times since then. We have now bought a little home in Tropico and are permanent, I hope.

The check was a great surprise to me, as I did not know that any salary was due the Doctor, not having attended the Convention.

I was glad to hear of the continued health of your father. Please remember me to him with thanks for his sympathy. The loving tender sympathy that I have received from all of my dear husband's friends has been a great help to me in this terrible trial. Nothing has gratified me more than the deep appreciation of his life work by the dental profession, and the tender love they express for him as a man.

Will you tell your father that I have not forgotten meeting him at the only Convention I ever attended with my husband. It was at Cincinnati in '63, I believe. Your father was the first friend to remember us after the great Chicago fire with help that was so much needed then.

With kindest regards for yourself and family, I am

Yours truly, LAVINIA L. CUSHING.

DEAR DR. MORGAN: GALVESTON, TEX., Dec. 22, 1900.

Your favor of the 19th inst., enclosing check for $100 from the National Dental Association, received, and passed to the Dentists' Relief Fund.

Allow me to thank you, and through you the National Association for the very kind sentiments expressed, and the substantial and timely aid given us in this the hour of our affliction.

Have written Dr. J. D. Patterson as you suggested. A merry Xmas to you. Yours very truly,

H. W. LUBBEN, D.D.S.

Dr. Jonathan Taft read his report as Chairman of the Committee on Necrology:

Report of Committee on Necrology.

Dr. W. H. Morgan.

Dr. W. H. Morgan was born in Logan County, Kentucky, Feb. 22, 1818. His father was a soldier in the war of 1812; his grandfather was a colonel in the Revolutionary War and a relative of the General Daniel Morgan of the Continental Army.

Dr. Morgan lost his mother when he was six years old. He had but few advantages for early education, notwithstanding which, as he increased in years his thirst for knowledge grew and he embraced every opportunity for increasing his learning. He obtained books whenever he could, selecting those that would be valuable to him. These he studied thoroughly, and thus developed a taste for reading. He was a thinker as well. Having these two qualities his acquisition of knowledge was rapid, considering the circumstances in which he was placed. After taking a course of tutelage in dentistry with Dr. Simpson of Kentucky, he entered the Baltimore College of Dental Surgery and took a regular course of study, graduating in March, 1848. After this he began the practice of dentistry in Russellville, Ky. In 1849 he removed to Nashville, where he entered into partnership with Dr. T. B. Hamlin, who at that time was the only graduate dentist in Tennessee. This relationship continued for ten years.

Dr. Morgan was elected a member of the Board of Trustees of the Ohio College of Dental Surgery in 1865, and later was elected President of that institution, which position he resigned in 1879 to accept the Chair of Clinical Dentistry in Vanderbilt University. He organized the dental department of this institution and held the position of dean until his advanced age compelled him to give up the work. During all this time he was Trustee of the Meharry Medical College for colored youth and took a great interest in the work of that institution. Dr. Morgan was one of the oldest dentists in the south at the time of his death. His interest in dental associations was very great. He became a member of the American Dental Association in 1865, and in 1870 was elected its president. He also filled the position of president in a number of other dental associations. He took great interest in other organizations and in their work, cooperating with them whenever it was practicable for him to do so, either by his presence or by pen, or both.

Dr. Morgan was a man of the strictest morality and eminently a Christian gentleman. He exercised remarkable influence over his professional brethren wherever he was known, not only in the south but throughout the north as well. He was a man of strong convictions, and was ever ready to avow them. He was a warm-hearted and genial friend, especially for all who valued his friendship and regard. He had very little patience with those who persistently avowed the wrong.

Though not a politician in the modern sense of the word at least, he had certain qualities that fitted him for a responsible position, which was fully verified by his appointment in 1885 to the Indian Commission by President Cleveland. He served during a portion of Harrison's administration, when he retired on account of advanced age.

His home life was a model one. In November, 1852, he married Miss Sarah A. Noel of Kentucky. He was the father of four children—one daughter and three sons, all of whom survive him and follow in the footsteps of the father and mother. Mrs. Morgan died a few years before him and her death was a crushing blow to him, and doubtless shortened his life.

In the death of Dr. Morgan not only this Association but the whole dental profession of this country, and to some extent that abroad, has sustained a great and irreparable loss. His efforts in

behalf of his chosen profession were continuous, enthusiastic and thoroughly efficient. In view of these things the Committee would present the following:

Resolved, That in the death of Dr. Morgan not only his family and friends have sustained an irreparable loss, but also his profession and the various interests which he served.

Resolved, That we will ever keep green in memory the noble character which he presented, and that we will endeavor to emulate his noble traits so broadly exhibited.

Resolved, That we commend the example which he has presented of noble character and Christian manhood to all those who are in the near future to enter the ranks of our profession, that his, and such examples be studied and emulated by them.

Resolved, That these statements and resolutions be engrossed in the proceedings of this body and properly prepared and sent to the family.

Resolved, That a page in the records be devoted to these resolutions.

Dr. H. J. McKellops.

Dr. H. J. McKellops was born at Salina, near Syracuse, New York, Aug. 31, 1823, died at his home at St. Louis, Mo., April 23, 1901, seventy-eight years of age. His father having died before he entered his teens, he removed with his mother and elder sister to St. Louis in 1840. He served for a time as page in the Missouri Legislature, and with the money thus earned he entered the State University at Columbia in 1842, to which place his mother removed and remained for two years while he was in the University. In 1844 the family returned to St. Louis. In 1846-47 he took a course in medicine at the old St. Louis Medical College. He took instruction in dentistry from his brother-in-law, Dr. Geo. Silvers, and from this on he practised dentistry.

Dr. McKellops had a natural aptitude for mechanics, which combined with an artistic temperament made him an expert operator in dentistry, and he soon took a position in the front ranks of his profession. He soon secured a very desirable practice, which he followed up to within some five or six months of his death.

He was a strongly individualized character, and became a leader in whatever he attempted to do. He was a person of strong convictions, always advocating any question he espoused with all the

intensity of an ardent nature. He stood firmly upon what he thought was right, and unsparingly denounced what he thought was wrong. He was a man of high ideas, warm hearted, a hater of shams, and a worker for better dentistry and higher attainments.

He early became engaged in association work for the advancement of his chosen profession. He was one of the founders of the St. Louis Dental Society, in 1856, cooperated in the organization of the Western Dental Association, and afterwards became its president. He was the first president of the Missouri Dental Association in 1865; was also president of the American Dental Association in 1879 and of the Southern Dental Society in 1885. He was a regular attendant upon all of these and a frequent visitor to many others. He was always active in the proceedings. Recognizing his ability as an operator and as one whose judgment was superior, he was in many instances made the conductor of clinics in many societies. In 1855 the Ohio College of Dental Surgery conferred upon him the degree of D.D.S. He was famous as a skillful and conscientious operator, a fame which in time became known throughout the world. It is safe to say that an inferior filling never came from his office. He did not believe in the use of amalgam as a filling material and never used it. In the use of gold he had no superior and few equals.

It was his habit to examine and test new devices and materials offered, adopting in his practice those which he found good, rejecting those which his judgment did not commend. His decision in such matters was promptly reached, seemingly intuitive, and practically unerring, as the verdict of the profession at large almost without exception sustained his opinion in time. He was an ardent supporter of the code of ethics, and did not hesitate to speak his mind about infractions of it by practicing dentists. Of those who gave public endorsement of remedies, the component parts of which they knew nothing, his denunciations were scathing and did much to eliminate this faulty practice. Whatever he knew was freely at the service of any practitioner who honestly wished to improve. He devoted much time and money to collecting and arranging a library of dental literature. He spared no pains and expense in making attainments in this direction.

Dr. McKellops was married April 4, 1849, to Miss Anna Gower of Tennessee, who survives him with five of their eight children. He was known in his profession as very few others are known; he

stood high in the esteem of his friends and was admired by all who knew him. In view of what he was and what he did, may his name be carried on to those who come after.

Resolved, That in the death of Dr. McKellops this Association has lost one of its most efficient and valued members, whose place will not be easily filled. One whose example every well-wisher of his profession may wisely imitate.

Resolved, That a page in the records be devoted to these resolutions and that a copy be sent to his family.

JONATHAN TAFT, *Chairman,*
WALDO E. BOARDMAN,
E. S. GAYLORD, *Committee.*

On motion, the report was unanimously adopted by a rising vote.

Dr. Thos. L. Gilmer of Chicago, read his paper. Subject, "Odontomes," illustrated with lantern slides.

The discussion was opened by Dr. Thos. Fillebrown, and continued by Drs. W. H. G. Logan. W. C. Barrett, J. S. Marshall, M. F. Finley, the essayist closing.

D. W. V-B. Ames of Chicago read his paper. Subject, "Splints for the Retention of Loose Teeth."

Discussion was opened by Dr. N. S. Hoff, and was continued by Drs. W. F. Litch, S. H. Guilford, J. D. Patterson, D. R. Stubblefield, Garrett Newkirk, E. A. Bogue, V. H. Jackson, the essayist closing.

Dr. H. J. Burkhart presented report of the Executive Council.

The Executive Council reports as follows:

Recommends—That Section III. hold a session in main hall at 3 o'clock P. M.

That the Secretary's salary, $400, also the Treasurer's salary, $100, be paid.

That a cablegram conveying greetings be sent to the British Dental Association.

That the following resolutions regarding Dr. Wms. Donnally be adopted:

Resolved, That this Association express its appreciation of the labors and sacrifices of Dr. Wms. Donnally in furthering the passage of the law creating the Army and Navy Dental Corps.

On motion, the report was concurred in.

Secretary read the report of committee appointed to consider the President's Address.

Aug 8, 1901.

To the National Dental Association,

Gentlemen:—Your committee appointed to consider that part of the President's address which relates to amendments, changes, and additions to the constitution and by-laws of this association, begs to report, that while approving the same, would recommend that it lie over one year.

We would further recommend that the Secretary be directed to have printed 1000 copies, and at once mail to each member a copy, that it may be carefully considered before it comes up for consideration at next annual meeting.

Signed:

J. Taft.
James Truman.
Henry W. Morgan.

On motion, the report was adopted.

Paper of Dr. G. V. I. Brown was called.

On motion, reading of this paper was postponed.

On motion, Association adjourned to meet at 8 p. m.

THIRD DAY—EVENING SESSION.

Thursday evening session was called to order by the Presiden at 8:30 o'clock.

Dr. H. J. Burkhart read report of Executive Council:

The Executive Council reports as follows:

Recommends—That a sum not to exceed one thousand dollars ($1,000) be appropriated to the fund for the suppression of fraudulent diploma mills.

That the election of officers be made a special order of business for 11 o'clock Friday morning.

That the Secretary read the report of the Committee on History, and that said report be accepted.

That the Secretary read the report on National Dental Museum and Library, and that said report be accepted.

That Dr. Richard Grady, Chairman of Committee on Hygiene in Public Schools, read his report, and that said report be accepted.

On motion, the report was concurred in.

Secretary read the report of the Committee on History:

Report of the Committee on History.

The Committee on History has the honor to report to the Executive Council that the work of collecting proper historical data is being carried on. In some respects we can report progress, in others the outlook is not so encouraging. The work, however, will be continued until a satisfactory result is obtained, and we ask not only the indulgence, but the cooperation of all men interested in the history of their profession.

We ask that this Committee of five be increased to seven members, and that Drs. Edward C. Kirk of Philadelphia and Jacob L. Williams of Boston, whose deep interest in historical matters is well known, be added to this Committee.

We ask, following the suggestion in previous reports, that the following gentlemen be "advisory members": Dr. Wm. H. Trueman of Philadelphia and Dr. Benjamin Lord of New York.

So far the expense of this Committee to this Association has beeu like the results obtained, small. The collection of data and the editing of data now at the service of the committe *will cost money*. At the next meeting we hope to make an exhibit of certain phases of the prerarator work which will enlist the interest of all the members and justify us in asking for a proper and generous appropriation.

CHARLES MCMANUS, *Chairman*,
JONATHAN TAFT,
GORDON WHITE,
H. B. NOBLE,
H. L. AMBLER.

Milwaukee, Aug. 8, 1901.

Adopted with recommendations.

Secretary read report of Committee on National Dental Museum and Library.

Dr. Grady read his report on Oral Hygiene.

On motion, the following resolutions were adopted:

The wives of the visiting dentists desire to express their appreciation to the Milwaukee members of the profession and their wives for the very generous, painstaking and hospitable entertainment provided for them during

the sessions of the National Association. It is a pleasure on their part to make this acknowledgment, and they request that the resolution be conveyed through the National Dental Association and spread upon its minutes.

MRS. B. L. THORPE.
MRS. C. E. ESTERLY.
MRS. W. H. G. LOGAN.

Dr. White of New York being called, discussed the report of Committee on Oral Hygiene. Discussion was continued by Dr. Burkhart of Oregon.

Secretary read proposed amendments to constitution and by-laws presented by Dr. L. G. Noel :

Dr. Noel, as Chairman of the Committee appointed at the recent meeting of the Southern branch held at Nashville, Tenn., is instructed to request a change in the wording of Section VII., article 14, as follows: In the second line strike out the word "two" and insert the word "three." In the third line strike out "three and put in "two."

L. G. NOEL,
W. E. WALKER,
WM. CRENSHAW, Committee.

By unanimous consent the rules were suspended and the proposed amendments were adopted.

Dr. G. V. I. Brown read his paper, also that of Dr. Black of Milwaukee.

The discussion was opened by Dr. Thomas Fillebrown and continued by Drs. M. C. Smith, W. H. G. Logan, B. G. Maercklein and Thomas L. Gilmer.

On motion, the subject was passed, the essayist closing the discussion.

Dr. C. L. Goddard read his paper. Subject, "The Incisor and the Profile, a Study in Comparative Anatomy."

The discussion was opened by Dr. A. O. Hunt and continued by Dr. C. N. Peirce.

On motion, further discussion was postponed.

On motion, Association adjourned to meet Friday morning at 9 o'clock.

FOURTH DAY—MORNING SESSION.

Friday morning session was called to order by the President at 9:30 o'clock.

On motion, it was directed that the disposition of Dr. Noyes' paper be left in his hands.

Dr. S. H. Guilford read his report as Chairman of Section II.

Report of Chairman of Section II.

Dental Education. The Section is pleased to report that the advance in dental educational matters has been pronounced during the year just past. The number of dental colleges in the United States has been but slightly increased. One has ceased to exist, and two new ones have been organized, so that while there were fifty in existence a year ago there are now fifty-one. This very slight increase is perhaps a matter of congratulation, since the needs of the country in this direction are abundantly supplied for the present.

With the enterprise characteristic of the American people, a dental college has been organized in the capital of our recently acquired possession, the Phillipines, by a former member of this Association. The colleges, stimulated by the general advancement of professional practice and scientific investigation, have not only improved the methods of teaching, but have extended it into fields hitherto but imperfectly cultivated. The standard of entrance has been gradually raised, the annual term lengthened, and by the act of the National Association of Dental Faculties just taken, four years of study will shortly be required. By the united influence of these varying changes the result cannot be otherwise than most beneficial, both to the students and the patients whom they will subsequently serve.

Another important factor in the progress that has been made in college teaching and methods is the State Boards of Dental Examiners. To these the colleges and the profession undoubtedly owe much, for by their wise supervision of the output of the colleges,

and the additional tests which they apply to ascertain the fitness of the graduates for practice, greater diligence is exercised by the dental teachers to prepare their students to pass the subsequent examinations with credit.

In states where a diploma is not a prerequisite for examination by state boards the latter have been largely instrumental in forcing candidates to take a college course, in order to properly prepare themselves for the ordeal of a state examination.

The status of the American degree in Europe has not only not advanced during the year, but has actually declined, owing to the continued issue of fraudulent diplomas by disreputable institutions in this country. It is a pleasure to state, however, that through the efforts of the Foreign Relations Committee of the National Association of Dental Faculties, aided materially by the reputable holders of American degrees in Europe, and by an awakened sense of responsibility on the part of the profession at large in this country, steps have been taken which in all probability will result in breaking up the illegal diploma traffic and reestablishing the good repute of the American degree in all parts of Europe.

It is a matter of congratulation that the efforts continued through many years to have our profession officially recognized by the U. S. Government through the appointment of dentists in the army have at last been successful. By act of Congress a dental corps was created and some thirty practitioners have received appointments in the army and been assigned to various posts. These appointments were made after an examination for qualification, which, both as to its thoroughness and high standing, has probably never been equalled by that of any state board or dental educational institution. In view of this we may feel assured that our first representatives in the army are men of recognized ability and broad culture, and that they will reflect credit upon the profession from whose ranks they were selected.

Dental Literature. In the periodical literature of the profession there have been no remarkable changes. Between the expiration of one and the establishment of another the number of periodicals remains about the same. In their character there seems to be a gradual improvement, for each one appears to be striving to serve its patrons with the best material at its command. The literature of the past year has been greatly enriched by the translation and

publication of some of the very valuable papers presented to the International Dental Congress of 1900. The permanent literature of the past year in this country has been added to by the publishing of a few new works, and new editions of works already in existence. The new works are: "Principles and Practice of Filling Teeth." By C. N. Johnson, M.A., L.D.S., D.D.S. "Dental Electricity." By L. E. Custer, B.S., D.D.S. "Treatment of Malocclusion of the Teeth." By E. H. Angle, M.D., D.D.S. "Dental Metallurgy." By C. J. Essig, M.D., D.D.S., and Dr. Koenig. "Interstitial Gingivitis." By E. S. Talbot, M.D., D.D.S. The reissues comprise: "Evans' Crown and Bridge Work," Sixth edition. "American Text-Book of Prosthetic Dentistry." Edited by C .J. Essig, M.D., D.D.S. Second edition.

The section has received and passed upon one paper, entitled "Bacteriology." By C. N. Peirce, D.D.S.

Dr. Peirce then read his paper. Subject, "Bacteriology."

Discussion was opened by Dr. C. P. Pruyn of Chicago.

On motion, the subject was passed.

Dr. W. E. Walker discussed Dr. Goddard's paper.

On motion, the subject was passed, the essayist closing.

Dr. Walker presented and explained a device of Dr. J. S. Marshall's, consisting of an appliance for attachment to the Kingsley interdental splint, and for Marshall's modification of the Kingsley splint for the treatment of those serious fractures of the superior maxillae and the diastasis (dislocation) of the superior bones of the face from the skull, such as he has illustrated in his work on Oral Surgery.

Dr. Hart J. Goslee, of Chicago, Chairman pro tem of Section VI, read his report.

Report of Chairman of Section VI.

The Committee desires to report the following Table and Surgical Clinics, given Thursday afternoon at 2:00 o'clock—

Surgical Clinics. These were held in the ampitheatre of the Dental Department, Milwaukee Medical College, and consisted of the presentation of many interesting cases, including congenital cleft palate, hare-lip, necrosis, empyema, etc , which were diagnosed and discussed at length by Drs. Thos. Fillebrown, Thos. L. Gilmer and G. V. I. Brown, followed by a general discussion. Dr. W. H. G. Logan operated on the antrum for empyema, and Dr. J. W. Slonaker extracted several teeth under nitrous oxid anesthesia, both with much success.

Table Clinics. The following were given in the Masonic Temple—1. "Method of Attaching Bridge to Anterior Teeth, without Destroying Natural Crowns," by S. Finlay Duncan. The method consisted simply of a gold inlay and post, as a means of anchorage for small bridges and was splendidly illustrated by models.

2. "The 'Wedge Lock' Replaceable Facing for Crown and Bridgework," by F. E. Roach. This clinic illustrated a simple method of attachment for a removable facing, which seemed to possess ample and sufficient strength, and was easily adapted.

3. "The 'Counter Sunk' Nut in Orthodontia," by W. W. Shryock. The application of the counter sunk nut to extensive cases was ably demonstrated by models of several practical cases with apparent success and effectiveness, and showed the usefulness of such a device when indicated.

4. "Porcelain Inlays and Restorations," by W. T. Reeves. This was one of the most interesting clinics given and attracted a large audience. The clinician very ably demonstrated the adaptation of matrices to cavities by burnishing, and the technique of inlay work in general.

5. "Porcelain Inlays, Demonstrating the Water-Bag Method," by J. S. Bridges. This consisted of a demonstration of the water-bag method of swaging matrices for inlays, and some good results were shown on models.

6 "Mounting Crowns and Bridges with Gutta-Percha," by A. W. McCandless. The technique of mounting crowns and bridges with gutta-percha, its advantages, and the use of the Kerr Electric Annealer for the purpose of heating the gutta-percha, were well demonstrated.

7. "A Broach-Holder of Original but Simple and Ingenious Design," was exhibited by C. B. Powell.

8. "Orthodontia Appliances," by C. D. Lukens. The clinician exhibited many new, original and ingenious devices to be applied to orthodontia, and demonstrated their application and usefulness by models.

9. "The Cleavage of Enamel with Special Instruments Designed for the Purpose by the Clinician," by A. G. Johnson. The cleavers presented by the clinician, while not new, were of original design, and the demonstration seemed to indicate most effective results in accomplishing the work.

10. "A Modified Davidson Spray for Warming Air and Solution for Injecting Medicaments into Pockets and Cavities at Comfortable Temperature, with Attenuated, Adjustable and Moveable Nozzle; and a Blow-Pipe Regulating the Supply of Gas and Air to Secure Perfect Combustion without Outside Valves," was exhibited by C. E. Esterly.

11. "Demonstration of the Use of Cement Syringe," by H. L. Cruttenden. While this is not a new device, its usefulness and application were well demonstrated by the inventor.

12. ' Orthodontia," by C. S. Case. Models were presented of a young man, 24 years of age, sent to Dr. Case by Dr. D. H. Allis of Springfield, Mass., for correction of a decidedly abnormal protrusion of the lower teeth and jaw. The models indicated that beautiful results were accomplished, and the case was completed in 9 months, most of the moving process being done by the patient.

13. "Construction of Porcelain Crown and Bridgework," by T. E Weeks. Heroic models were used in this clinic to demonstrate the principles and methods of bridge construction.

14. "Demonstration of Griswold's Removable Bridge System," by L. G. Fullerton. The practical application of this system was demonstrated by models of several cases, and proved an interesting clinic.

15. "Exhibition of Dr. Millett's Crown and Bridge System," by J. G. Hollingsworth. This system involves simply a large die-plate consisting of over 400 cusp-forms, and the swaging is done quickly in sealing wax, of which the dies are made, by the use of a cylinder and plunger.

16. "Porcelain and Gold Crown and Bridgework," by O. J. Fruth. This clinic was an exhibition of gold and porcelain crown and bridgework mounted upon models, and was beautifully done.

No. (Operator)	Result. (Designating Each Tooth.)		Method and Manipulative Procedure.			
			Cleaning and Enlarging.	Drying.	Lubricating Substance.	Filling Material.
	A.	B.				
1	Imperfect.	Perfect.	Gates-Glidden Drill and Twist Broaches.	Alcohol-Air.	Sol. Eucaylptus and Gutta-Percha.	Gutta-Percha Cones.
2	Imperfect.	Imperfect.	Twist Broaches.	Electric Drier.	Sol. Eucaylptus and Gutta-Percha.	Gutta-Percha Cones.
3	Imperfect.	Perfect.	Barbed Broaches.	Alcohol and Compressed Air.	Eucaplytus.	Chloro-Percha and Gutta-Percha Cones.
4	Perfect.	Perfect.	Barbed and Twist Broaches.			Oxychlorid Zinc, Gutta-Percha Cones and Amalgam.
5	Perfect.	Perfect.	Gates Glidden Drills and Barbed Broaches.	Hot Air.	Eucalyptus and Gutta-Percha	Gutta-Percha Cones.
6	Imperfect.	Perfect.	Sulphuric Acid, Spiral and Barbed Broaches.	Alcohol and Hot Air.		Asbestos, Aristol, & Gutta-Percha Cones dipped in Chloro-Percha.
7	Imperfect.	Imperfect.	Sulphuric Acid, Spiral and Barbed Broaches.	Alcohol and Chloroform.	Oil Cajuput.	Chloro-Percha and Gutta-Percha Cones.
8	Perfect.	Imperfect.	Sulphuric Acid, Williams' Reamer and Broaches.	Alcohol and Air.	Eucalyptus.	Copper Points, Chloro-Percha and Gutta-Percha Cones.
9	Perfect.	Imperfect.	Broaches, Sulphuric Acid and Bicarbonate Soda.	Alcohol and Root Drier.	Chloroform.	Gutta-Percha Cones.
10	Perfect.	Perfect.	Sulphuric Acid, Ammonia, Barbed Broaches.	Compressed Air.		Chloro-Percha and Gutta-Percha Cones.
11	Perfect.	Perfect.	Broaches.	Alcohol and Air.	Eucalyptus.	Chloro-Percha and Gutta Percha Cones.
12	Perfect.	Imperfect.	Sulphuric Acid, Broaches.	Alcohol and Air.	Eucalyptus.	Chloro-Percha and Gutta-Percha Cones.
13	Perfect.	Perfect.	Sulphuric Acid, Barbed Broaches.		Alcohol and Sandarac Varnish.	Copper and Gutta-Percha Cones.
14	Perfect.	Perfect.	Twist Broaches.		Alcohol and Sandarac Varnish.	Gutta-Percha Cones.

17. "Root-Filling Clinic." This proved a most interesting feature, showing the degree of success achieved, and the great variation of methods pursued by the operators. The canals of the teeth properly mounted were filled by the following: R. H. Hofheinz, S. C. G. Watkins, C. N. Johnson, E. K. Wedelstaedt, C. P. Pruyn, J. D. Patterson, L. S. Tenney, W. A. Johnston, M. L. Hanaford, H. L. Banzhaf, J. E. Keefe, J. W. Wassall, Elgin MaWhinney, J. J. Wright. Of the twenty-eight teeth so filled their subsequent dissection showed twenty practically perfect root fillings. The appended abbreviated record, in which the identity of the operator has been purposely lost, will prove interesting and show the results.

HART J. GOSLEE, *Chairman pro tem.*

Supplementary report of Committee on President's address was read.

In the President's address it is suggested that this Association give encouragement to state and local associations so far as it may be feasible. Your Committee, fully endorsing this suggestion, would offer the following:

Resolved, That the President of this body be authorized to appoint a committee of three whose duty it shall be to carry out the above suggestions, and report annually to this Association.

Respectfully submitted,

J. TAFT.

On motion, report was adopted and the President appointed Drs. Jonathan Taft, Henry W. Morgan and Chas. McManus, committee in accordance with the resolution.

Organization of Sections for ensuing year was reported as follows. Sec. I—H. J. Goslee, Chicago, Chairman; W. E. Walker, New Orleans, Sec'y. Sec. II—S. H Guilford, Philadelphia, Chairman; M. F. Finley, Washington, Sec'y. Sec. III—D. M. Cattell, Chicago, Chairman; F. B. Noyes, Chicago, Sec'y. Sec. IV—J. D. Patterson, Kansas City, Chairman; Emma Eames Chase, St. Louis, Sec'y. Sec. V—Thos. Fillebrown, Boston, Chairman; W. H. G. Logan, Chicago, Sec'y. Sec. VI—Robt, H. Nones, Philadelphia, Chairman; W. D. Tracy, New York, Sec'y.

Dr. J. D. Patterson announced the names of cities desiring the next annual meeting.

Dr. Thos. L. Fillebrown desired to discuss the subject.

The Chair ruled that Dr. Fillebrown was out of order.

Dr. G. V. I. Brown appealed from the decision of the Chair.

Vote being taken, the decision of the Chair was not sustained.

Dr. Thos. Fillebrown then spoke in behalf of Boston.

Dr. J. N. Crouse spoke in behalf of Niagara Falls, as did also Dr. W. C. Barrett.

Dr. N. S. Hoff spoke in behalf of Detroit.

Ballot being taken, Niagara Falls was selected as the place for the meeting in 1902.

Eleven o'clock, the hour set for the election of officers, having arrived, the Association proceeded with that order of business.

By ballot, Dr. J. A. Libbey of Pittsburg was elected President for the ensuing year.

Dr. S. H. Guilford of Philadelphia, Vice-President for the East.

Dr. L. G. Noel of Nashville, Vice-President for the South.

Dr. W. P. Dickinson of Minneapolis, Vice-President for the West.

Dr. Josephine D. Pfeiffer of Chicago was elected Corresponding Secretary.

Dr. A. H. Peck of Chicago was reelected Recording Secretary.

Dr. H. W. Morgan of Nashville was reelected Treasurer.

Dr. H. J. Burkhart, Batavia, N. Y., Dr. B. Holly Smith, Baltimore, Dr. J. Y. Crawford, Nashville, Dr. C. C. Chittenden, Madison, Wis., Dr. M. F. Finley, Washington, Executive Council.

Dr. Chas. S. Butler, Buffalo, Dr. W. N. Cogan, Washington, Dr. G. V. I. Brown, Milwaukee, elected members of Executive Committee.

On motion, the newly elected officers were installed.

The President appointed Drs. H. J. Burkhart, Batavia, N. Y., M. O. Cooley, Niagara Falls, N. Y., and C. W. Stainton, Buffalo, as Local Committee of Arrangements.

He also appointed Drs. A. H. Peck, G. V. I. Brown and Thos. L. Gilmer as Committee on Publication.

Dr. Robert Nones of Philadelphia was appointed Chairman of Section VI.

Organization of Executive Committee for ensuing year was reported as follows: Dr. J. D. Patterson, Chairman; Charles S. Butler, Secretary. 1st. Division—J. D. Patterson, C. N. Johnson, H. A. Smith. 2d Division—V. H. Jackson, T. S. Waters, W. N. Cogan. 3d Division—C. S. Butler, G. V. I. Brown, T. P. Hinman.

On motion, the Association adjourned.

A. H. Peck, *Recording Secretary.*

Minutes of the Executive Council.

TUESDAY, AUGUST 6, 1901.

The Executive Council met in Masonic Temple Hall and was called to order by the President, Dr. G. V. Black, at 10 o'clock a. m.

The Secretary read his annual report:

To the Executive Council of the National Dental Association.

GENTLEMEN: The Recording Secretary of the Association respectfully submits the following report:

A faithful and accurate record of the minutes of the last meeting was kept.

At the close of the meeting of 1900 I communicated with the members of the Association with a view of determining to which Section they wished to be assigned.

Early in the month of July, under the direction of Dr. J. D. Patterson, Chairman of the Executive Committee, and Dr. G. V. Black, President of the Association, three thousand circular letters announcing the present meeting were mailed to various society members throughout the United States. Also, later in the month, July 25, three thousand program books were mailed to the same list.

Current bills during the year to the amount of one hundred sixty dollars and sixty-one cents ($160.61) have been paid. Said bills accompany this report.

Respectfully submitted,

A. H. PECK, Rec. Sec'y.

Audited and found correct.

V. H. JACKSON,
CHAS. MCMANUS,
Auditing Committee.

The annual report of the Corresponding Secretary was read, and, on motion, was accepted.

Gentlemen of the National Dental Association.

Your Corresponding Secretary has answered all letters addressed to her, and has sent notice of this meeting to each state society, near the time of

its annual meeting; also a printed notice to every dental society in the United States, so far as it was possible to obtain name and address.

Blank certificates for delegates have been sent each society desiring them.

Expenditures—Printing, typewriting, postage and stationery—$34.75.

Respectfully,

MARY ESTHER GALLUP, Cor. Sec'y.

Dr. J. D. Patterson, Chairman of the Executive Committee, presented his annual report:

To the Executive Council of the National Dental Association:

GENTLEMEN:—An appropriation of one hundred dollars ($100) was sent to the dentists of Galveston who suffered from the great flood. This appropriation was sent to the President of the Galveston Dental Society as the proper authority to look to its distribution. This was an emergency action, in which it was not possible to consult a quorum of the Executive Committee, and was authorized by the President, Dr. Black, the Treasurer, Dr. Morgan, and your Chairman. The donation was very gratefully received and acknowledged, and we ask ratification of the action.

Your Chairman commenced correspondence with the railroad authorities respecting reduced rates early in January. We brought to bear all possible influence to secure a lower rate than the usual one and one-third, but did not succeed. This rate was secured from the following: Western, Central, Trunk Line, Southeastern, New England, and Southwestern Passenger Associations. These Associations control the traffic in practically all of the territory in the United States from which delegates were expected—except the far west, which is controlled by the Transcontinental Association and whose agent wrote that he was not justified in making the one and one-third rate as so few would travel from that territory.

Your Committee after considerable correspondence secured an extension of the usual time upon these tickets, allowing from July 31 to Aug. 6 for the purchase of tickets and returning not later than Aug. 14. In this way the rate secured was made available for members of the National Association of Dental Examiners and the National Association of Dental Faculties. The services of the joint agent of the railroads who vises the certificates was secured for Wednesday, Aug. 7, the second day of the National meeting, as it was thought that day would best accommodate the three Associations. For this service the railroads compel a fee of eleven dollars ($11.00), which your Chairman paid—receipt hereto attached. In arranging for the meeting your Chairman, accompanied by President Black, and Dr. C. N. Johnson of the Executive Committee, visited Milwaukee in March, looked the ground over and secured the Masonic Temple Assembly Hall, with six additional rooms for committees and table clinics, engaging to pay for the same for four days and three nights the sum of one hundred and fifty dollars ($150.00). We were unable to get the hall for Wednesday evening, the 7th, as it had been secured by a society and the directors were unable to make a

change. Therefore your Council can make such arrangement as it sees fit to make up the unavoidable absence of the night meeting. We would suggest an afternoon meeting, if feasible.

Circulars to the number of three thousand giving all necessary information respecting the meeting were sent out the latter part of June, and the programs which are before you were mailed by the middle of July.

In doing the work of preparing for the meeting the matter of the program has been ably gathered by the Corresponding Secretary, Dr. Mary E. Gallup, and President Black. Of course it was secured primarily by the chairmen of the different sections. It is of course simply proffered matter, both as to essays and clinics, and the weeding out process must devolve upon the sections and their officers.

In the compilation of the circulars and programs the labor has fallen upon the able Recording Secretary, Dr. A. H. Peck, who has faithfully performed that work, being constantly advised by the President, Dr. G. V. Black.

The Committee on Local Arrangements, Dr. G. V. I. Brown, Chairman —assisted by Dr. Goslee of Chicago and Dr. Babcock of Milwaukee—should receive the warmest praise for successfully performing their manifold and trying duties.

The Chairman desires also to acknowledge the able advice and assistance of Dr. C. N. Johnson of Chicago, of the Executive Committee.

Respectfully submitted.

J. D. Patterson, *Chairman.*

On motion, the report was accepted, and all bills therein were ordered paid.

Dr. Chas. S. Butler read the minutes of the morning session of the Executive Committee.

Meeting of the Executive Committee held Aug. 6, 1901, at Masonic Temple, with the following members present: Dr. J. D. Patterson, Chairman, Dr. C. N. Johnson, Dr. V. H. Jackson and Dr. C. S. Butler.

On motion, Dr. W. N. Cogan, Washington, was appointed to fill the vacancy caused by the absence of Dr. T. S. Waters.

On motion, Dr. Chas. McManus, of Hartford, Conn., was appointed to fill vacancy caused by the absence of Dr. T. P. Hinman.

On motion, it was recommended that the action of the President in securing Dr. John S. Marshall to represent the Army and Navy Dental Corps be ratified.

On motion, it was recommended that the minutes of the last annual meeting, held at Old Point Comfort, Va., 1900, be ratified.

On motion, it was recommended that a general session be held Wednesday afternoon, commencing at 2 o'clock, and that the clinics be held Thursday afternoon.

On motion, the Council adjourned to meet at 7 p. m.

Tuesday evening session was called to order by the President at 7 o'clock.

Minutes of previous session were read and approved.

On motion, it was recommended that all who open discussions be limited to ten minutes, and all succeeding speakers be limited to five minutes.

The report of Dr. Wms. Donnally, Secretary of the Committee on Army and Navy legislation, was read by Dr. H. J. Burkhart.

Report of the Committee on Army and Navy Dental Legislation.

TO THE OFFICERS AND MEMBERS ON THE NATIONAL DENTAL ASSOCIATION: In this the third annual report of your Committee on Legislation relating to Dental Surgeon service for the Army and Navy, we respectfully report our work concluded for the present so far as appertains to the army, by the act of Congress approved February 2, 1901, which provides for the employment of thirty Army Dental Surgeons "under the terms and conditions applicable to Army Contract Surgeons."

As the provisions of this law are exactly the same, except that the number of dental surgeons was reduced from one hundred to thirty, as the widely published bill prepared by the Secretary of your Committee and submitted to Congress through Senator Pettus of Alabama and Representative Otey of Virginia, it is not necessary to introduce it here.

While not unmindful of your instructions (for which see transactions of your second annual meeting and the *Dental Cosmos* for

September, 1899, p. 916), the matter of the status to be accorded the Army Dental Surgeon has been regarded as of paramount importance, as was clearly stated in our first annual report, and evidenced by every act of your Committee both before and since. We risked nothing, however, in contending for and obtaining the best status practicable or even possible under existing conditions. The flexible contract system was adopted by Congress to meet the emergencies growing out of the Spanish war and under the policy of the Medical Bureau it is an entrance-way for the better adapted to enter the commissioned ranks.

The permanency of the connection of dental surgeons with the Army was nowhere questioned nor in any way provided against, nor was their employment looked upon by any one of the hundreds whose views your Committee sought, as in the light of an experiment, nor is it the policy of Congress or of the War Department to permit experiments to be tested on the Army, and neither were the labors of your representatives directed to the exploitation of an experiment. On the contrary, the necessity of permanently providing the army with competent dental service was almost universally accepted as settled, and there was a distinct understanding with the Surgeon-General that his approval of the terms of the bill was made with the intention of recommending, as soon as authority was granted for the commissioning of Contract Surgeons, that authority be granted for the commissioning of Contract Dental Surgeons in such numbers as experience in the meantime would warrant.

Thus the transition of the corps from the contract to the commissioned status, under such restrictions as are suitable to protect the interests of the Government and the honor of the profession, was provided for in advance. When the time comes for the dental profession to consider and determine its proper attitude with reference to promoting the legislation necessary to improve the status and the representative character of the Army Dental Surgeon, there will probably be presented to your view new phases, factors, and personal interests, the influence of which will affect in different degrees the profession, the Department, the Congress and the friends of the selfishly interested.

Your Committee has had the most hearty, unselfish and commendable cooperation in this work of a large proportion of those designated as "a committee at large to act in accord with the

present one," and other members of the profession have also faithfully cooperated, and it has been a serious question with your Committee as to how credit might be given where it is due with even-handed justice. We refer this question to you. We ask, however, that a special vote of thanks be tendered the Hon. E. W. Pettus of Alabama, who modestly and quietly and from a sense of duty conducted the bill through the Senate; to the Hon. P. J. Otey, who accepted the bill and plan of the secretary of your Committee, although the bill differed materially from one he had offered in May, 1898, and faithfully, persistently and successfully conducted the difficult work in the House; to Dr. W. O. Owen, a Major and Surgeon of the U. S. Army, who has been an advocate of commissioned dental surgeons for years, and who took with him to the Phillipine Islands Dr. W. H. Ware and Dr. Gibbons, to render dental service to the military at that time proceeding from Camp Merritt; and to Dr. Louis Ottofy of Manilla, who took up the cause against his private interests and at our request secured the endorsements of eighty-five surgeons and several hundred line officers then in the Phillipine Islands, which were forwarded for the use of your Committee with the consent of the Military-Governor, General MacArthur.

In reference to securing legislation providing Dental Surgeon service for the Navy, we have to report that, in our opinion, the work already done, directly and indirectly, by the effort made for the Army Dental Surgeon Corps, has made it quite a simple and easy matter to succeed in securing legislation providing Dental Surgeon service for the Navy. Something of Surgeon-General Van Reypen's views was reported last year; he has recently promised to consider and conclude the matter in time for this Committee to take such action as it may deem necessary before Congress meets.

We therefore recommend that the matter be left to the Committee on Army and Navy Dental legislation with instructions to pursue such a plan as it may adopt after a conference with the Surgeon-General of the Navy and the Executive Council of this Association.

M. F. Finley, *Chairman.*
Wms. Donnally, *Secretary.*
Chas. S. Butler.
J. A. Libbey.
Gordon White.

On motion, the report was directed read before the general session and that said recommendations be concurred in.

Dr. J. D. Patterson, Chairman of the Executive Committee, stated that Dr. Wedelstaedt wanted to read his paper before a Section, but did not want it read before the main body.

On motion, it was ordered that any paper presented to a Section becomes the property of the Association.

Dr. W. H. G. Logan, Secretary pro tem, presented report of Section V.

On motion, the report was accepted and ordered read before main body.

By request of Dr. H. J. Goslee, acting Chairman of the Clinic Committee, Dr. Thos. Fillebrown was directed to act in conjunction with him in regard to some proposed clinics, their joint decision in said cases to be final.

Report of Committee on Clinics was read by Dr. H. J. Burkhart.

The Clinic Committee, representing Section VI, respectfully submits the following revised program of clinics:

TABLE CLINICS.

1. Method of Attaching Bridge to Anterior Teeth, Without Destroying Natural Crowns. S. F. Duncan.
2. The "Wedge-Lock" Replaceable Facing for Crown and Bridgework. F. E. Roach.
3. The Use of the "Counter Sunk" Nut in Orthodontia. W. W. Shryock.
4. Porcelain Inlays and Restorations. W. T. Reeves.
5. Porcelain Inlays, Demonstrating the Water-Bag Method. J. S. Bridges.
6. Mounting Crowns and Bridges with Gutta-Percha; Using the Kerr Electric Annealer. A. W. McCandless.
7. Gold Filling, Labial Cavity, Using Hatch Cervical Clamp. R. C. Powell.
8. Contour Filling with Watts' Crystal Gold in the Upper Anterior Teeth. J. O. Brown.

9. Jacket Crowns. E. G. Snodgrass.
10. Pinless Teeth in Crown and Bridgework. W. R. Wright.
11. Orthodontia Appliances. C. D. Lukens.
12. The Cleavage of Enamel with Special Instruments Designed for the purpose by the Clinician. A. G. Johnson.
13. Porcelain Inlay Work. W. H. Cudworth.
14. Exhibition of Dr. Millett's Crown and Bridge System. J. G. Hollingworth.
15. Modified Davidson Spray for Warming Air and Solution for Injecting Medicaments into Pockets and Cavities at Comfortable Temperature with Attenuated, Adjustable and Movable Nozzle. A Blow-pipe, Regulating Supply of Gas and Air to Secure Perfect Combustion Without Outside Valves. C. E. Esterly.
16. Porcelain Inlays. J. S. Batchelor.
17. Exhibition of Prosthetic Technic Work. P. D. Wright.
18. Exhibition of Operative Technic Work. R. J. Wenker.
19. Demonstration of the Use of the Cement Syringe. H. L. Cruttenden.
20. Orthodontia. C. S. Case.

SURGICAL CLINICS.

1. Extracting with Nitrous Oxid Gas. J. W. Slonaker.
2. Replantation as a Radical Cure for Pyorrhea Alveolaris. J. E. Keefe.
3 Extracting with Gas, Using Hurd's 20th Century Inhaler. W. H. Carson.
4 Surgical Clinics. Drs. Thos. Fillebrown, Thos. L. Gilmer, G. V. I. Brown, W. H. G. Logan.
5. Pyorrhea Alveolaris. Robert Good.

We suggest that the Table Clinics be open at all times during the meeting, except when the general body is in session, and that the Surgical Clinics be announced for Thursday afternoon at 2 o'clock at the Dental Department of Milwaukee Medical College.

Respectfully submitted,

H. J. Goslee, *Chairman pro tem.*

On motion, the report was accepted.

On motion, Council adjourned to meet at 10 o'clock Wednesday morning.

Wednesday morning session called to order by Dr. H. J. Burkhart at 10:30 o'clock.

Minutes of previous session were read and approved.

Dr. T. E. Weeks, Chairman of Section III, presented his report.

Report of Chairman of Section III.

SECTION III would report that five papers were received, as follows: "The Mallet as a Source of Energy," Dr. Clayton H. Stearns, Owatonna, Minn.; "Structure of Enamel in Relation to the Formation of the Walls and Margins of Cavities," illustrated with lantern slides, Dr. Fred B. Noyes, Chicago; "Bodies and Color Effect in Porcelain Inlay Work," Dr. W. T. Reeves, Chicago; "Cavity Preparation and Matrix Formation in Porcelain Inlay Work," Dr. A. E. Peck, Minneapolis; "Bleaching Enamel," Dr. Joseph Head, Philadelphia.

These papers have been recommended to be read before the general session, by unanimous vote of the Section.

THOS. E. WEEKS, *Chairman.*

On motion, the report was accepted.

Dr. Richard Grady, Chairman of Committee on Oral Hygiene in Public Schools, presented his report.

Report of the Committee on Oral Hygiene.

TO THE NATIONAL DENTAL ASSOCIATION: We hereby make our first report. The Committee appointed—Drs. Richard Grady of Maryland, H. H. Johnson of Georgia, I. P. Wilson of Iowa, F. W. Stiff of Virginia, and W. E. Walker of Mississippi—organized by electing Dr. Grady Chairman, and Dr. Walker Seccretary.

Two meetings were held at Old Point Comfort during the third annual session of the Association, at which a tentative plan was discussed and adopted. The task of communicating this plan to the state societies, and others, numbering fully one hundred, was entrusted to the Secretary, whose report, herewith submitted, will furnish statistical information. The Committee has been fortunate in having the gratuitous services of such an able Secretary, and wishes to take this opportunity to acknowledge the commendable zeal of Dr. Walker.

The suggestions toward popularizing oral hygiene have everywhere been received with favor. General knowledge of the causes of dental evils, the means of preserving the teeth by regular care, ought to form a part of the teaching of general hygiene in the schools. With the supporting influence of this National Association, and the mutual cooperation of the state and local societies with school boards, it is unquestionably true that children can be instructed in oral hygiene. The most important argument in favor of the examination of the mouths and teeth of school children is the educational benefit it would be to the community. Is it not the duty of the school to arouse society to intelligent thought on the importance of better modes of life? Is it not the duty of the school to train people to live better? Is not this the true purpose of the school? The logical place to begin this is with the physical life of society, the one phase of life that has been the most ignored by our educational methods.

The subject of instruction in oral hygiene in schools should form a definite, systematically arranged series of topics discussed in such a way that children may be interested. Such a synopsis of a proposed text-book was presented to the Mississippi Dental Association, April, 1900, by Dr. Talbot, as follows:

Chapter I.—*The Oral Cavity.* General arrangements. The walls. The hard and soft palate. The upper and lower maxillae. The teeth. The tongue. The gums. The salivary glands.

Chapter II.—*The Maxillae.* Their development, structure, shape. Change of shape at different ages. Blood supply. Attachments. Articulation. The alveolar process.

Chapter III.—*The Teeth.* Their development. The calcification and decalcification of the temporary teeth. Shape of each. Their arrangement. Names. Time and order of eruption. Dis-

eases attending eruption. Permanent teeth. Names. Shape. Articulation and arrangement. Time and order of eruption. Source of nutritive and sensitive supply. Arrangement of the enamel, dentin, cementum and pulp. Physical and chemical composition of enamel, dentin and cementum. The attachment of the teeth.

Chapter IV.—*Caries.* Predisposing causes: Faulty formation, manner of contact of proximal surfaces; hereditary influences. Active causes: Morbid condition of fluids of the mouth; mechanical abrasion; uncleanliness. Prophylactic treatment: Diet; mouthwashes; dentifrices: brushes; picks; silk; rubber; use of gum; tobacco; hygiene during dentition. Examinations. Fillings.

Chapter V.—*Calculus.* Salivary. Serumal. Alveolar. Abscess. Ptyalism.

Chapter VI.—*Odontalgia.* Local odontalgia. Reflex odontalgia. Reflex neurosis of dental origin.

Chapter VII.—*Antiseptics.* Disinfectants. Deodorants. Germicides.

Chapter VIII.—*Mastication.* Insalivation, etc., of food.

Chapter IX.—*Foods.* Those containing nutriment for the teeth and bones. When and how they should be taken.

Chapter X. — *Congenital Defectiveness and Deformity of Teeth.* Immediate causes of deformity, as, 1, deficient nutrition; 2, diseased nutritive fluids; 3, imperfect formative organs; 4, diseased formative organs. Influences modifying the development of the teeth, as 1, heredity, 2, civilization; 3, nervous disturbances; 4, diseases; 5, drugs and artificial diseases. Anomalies of the teeth and maxillae, 1, excess of individual teeth; 2, deficiency of individual teeth; 3, multiple dentition; 4, lack of dentition; 5, anomalies of arrangement; 6, malposition of individual teeth; 7, imprisoned teeth; 8, anomalies in size, structure and shape; 9, advanced and retarded eruption.

Public schools are made use of to a greater or less degree for the dissemination of hygienic knowledge in most civilized countries. The thoroughness and the mode of instruction cannot be conclusively judged from the reports. Much has been done in this country for the study of "physiological temperance," as most states and territories have a temperance educational law which requires instruction in the danger of alcohol, but in many states the instruction is not limited to narcotics and stimulants. For instance, one

physiology which has been translated into five different languages, with several hundred thousand copies published, teaches this: "The teeth should be examined that if enamel is removed and decay commenced they may be filled with gold foil. All amalgams, pastes and other cheap patent articles should be rejected, both for the sake of the teeth and the general health." The author of this school physiology must have heard of mercurial poisoning from amalgam fillings! Another, a primer intended for instruction of children in the schoolroom, by "one of the most skillful dentists of the country, enlivened by bright illustrations which children will enjoy," teaches "that milk is a good food, but it is better for the teeth after it has been boiled than when left uncooked"; that "our teeth will let us have all the eggs we want, but they like them best soft boiled"; that "we may have all the fish we want, say our teeth, if we only eat what is fresh and sweet"; that the "pretty red color of the cheeks and lips of the Irish are due to their habit of eating potatoes"; that "tartar affects saliva and makes food hard to digest"; that birds eat gravel and sand "to make their food digest"; and answers the question, "Why does a dog keep on gnawing his bone after the meat is all gone?" by saying, "He does it to keep his teeth clean and strong."

Greater efforts in behalf of disseminating oral hygienic knowledge in schools have lately been made in Alabama, where "the way is open to us"; in Florida where "the State Superintendent of Education is very favorably impressed on the subject"; in Illinois, where the Odontographic Society of Chicago has "sent circular letters to the Boards of Education in all civilized countries in cities of one hundred thousand or over, asking them concerning such a movement, and gathering data upon the subject"; in Massachusetts, where "a committee of five has been appointed to investigate and report on the best method of getting at the condition of children's teeth in the public schools"; in Maine, where the subject has been discussed and a committee appointed; in Mississippi, where the matter is in charge of a special secretary; in New York, where the state society has appointed a committee of six, and its chairman, Dr. T. B. Hyatt, has already examined five hundred children in Brooklyn and reported results on blanks furnished by this Association; in Texas, where a committee from the medical society is working jointly with one from the state dental society; in Maryland,

where a committee has planned for the examination of the mouths and teeth of school children, for talks to the students of the high schools on the care of the mouth and teeth, and for the aid of assistance in sterilizing instruments and in filling out examination blanks, and the Baltimore County Medical Association (as the result of a paper on the "Preservation of the Health of the Mouth") unanimously adopted a resolution recognizing the benefits of oral hygiene, approving the efforts to give instruction to pupils of public schools on the care of the mouth and teeth, and urging cooperation of boards of health and education in providing for detailed examinations and reports; in the Seventh District Dental Society of New York, where "the Committee is working to the end of having suitable matter inserted in the text-books"; in Virginia, where arrangements are being made for work in the fall; in Connecticut, where a committee has been appointed to confer with the school authorities; in the Duluth and Superior Dental Associations, where a committee has been appointed to go into the schools and make the examinations, two dentists for each city. From the District of Columbia Dental Society comes the word, "We shall be glad to obtain statistics for any number of examination blanks you may wish to furnish"; from the Galveston Dental Society, "Send the blanks and we will fill them out"; from the Toledo Dental Society, "The committee appointed by the local society has been waiting for some definite action by the National Dental Association giving rules and suggestions that we might all work on the same line, so send examination blanks and diagrams"; from Cedar Rapids Dental Society, "Nothing of the kind has been done in this city, but we are willing to do it, if permission can be had from the school boards"; from Pittsburg, where Dr. Habeggar obtained permission from school directors of that city to make examination of children attending the Morehead Sohool and examined three hundred and sixty-eight children. A significant fact in this report is, that out of fifteen hundred children in the school only nine refused to be examined.

The writings and addresses of professional men on the subject are familiar to you as readers of dental journals, so no quotations are noted in this report, but as evidence that the question is timely note some articles published in the *School Journal* of New York and the *Teachers' Institute* of Chicago, of which an editorial from the *School Journal* of Feb. 9, 1901, follows:

"*Care of the Teeth.* Physiology has become one of the fundamental studies in the elementary schools. In connection with it is given instruction in the simple laws of hygiene. Special attention is devoted to the evil effects of alcoholic beverages and narcotics. All this is commendable and encouraging to the friends of educational progress. The well-being of the body cannot be too highly regarded in the making up of school programs.

"One logical result of the more intelligent interest of the people in matters concerning the health of children is the introduction of expert medical inspection of the schools. Thus far this inspection has confined itself largely to the sanitary conditions of school buildings and the general health of pupils. If there has been any specialization it has been examination into the condition of children's eyes and ears, and perhaps also of the nose and throat. One important factor seems to have been largely disregarded, and that is the need of a periodical dental inspection. The principal reason for the oversight is probably to be found in the lack of interest on the part of the average physician in the health of teeth. This field has long been left entirely to the dentist, and the latter has not, at least in the United States, been made a member of the boards of medical examiners for schools.

"In Germany, France, Belgium, Sweden and Japan the importance of the examination of school children's teeth by a competent dentist has long received practical recognition. In Great Britain the question has been agitated for years, and all signs point to a speedy adoption of dental inspection and the teaching of the proper care of the teeth at least in city schools.

"The usual plan is to employ dental surgeons to make periodical examinations of every pupil. Records are kept and parents are advised concerning proper care, or free treatment is given to the poor. A similar system is very much needed in this country. State, county and municipal examiners of children's teeth must become a part of the public elementary school machinery.

"Meanwhile instruction in the care of the teeth ought to be made part of the elementary sehool course in physiology and hygiene. So much depends upon cleanliness and health of the mouth and teeth that the reasonableness of this proposition will be at once recognized. The decay of the temporary teeth may work lasting injury. Digestion is frequently impaired by imperfect mastication

due to defective molars. The presence of microbes bred in particles of food left between the teeth is often the source of serious stomach troubles. Nervous difficulties of various kinds can be traced to neglect of the teeth. And the inference is by no means far-fetched, that the development of serious lung diseases has resulted from a neglected mouth. The wisdom of increased attention to the education of children in the things affecting their present and future health and strength is evident to every intelligent adult. No difficulty ought to be encountered, therefore, from the side of school officers in introducing lessons on the care of the teeth and mouth in the elementary schools."

Helpful suggestions are solicited by the Committee in the discussion of its report. The committee asks to be continued in its present membership, or by change of members, with authority to draw upon the treasury for future work. The following resolution is also proposed:

Resolved, That the President be authorized to enter into an agreement with some person or persons qualified to write a short general treatise on Oral Hygiene, on the basis of paying a definite sum for services if the production should not be accepted, and a further amount if the work should be adopted by this National Dental Association, and that ———— be appropriated for the purpose.

Respectfully Submitted,

RICHARD GRADY, *Chairman.*

On motion, the report was accepted.

The Annual Report of the Treasurer was received, and, on motion, was accepted .

Treasurer's Report:

RECEIPTS FOR 1901.

Balance on hand July 13, 1901	$1,095.15	
Collected since (30-96)	1,883.00	
		$2,978.15

DISBURSEMENTS.

Committee on appointment of dentists in army	806.60
Salary of Secretary	200.00
Mrs. Geo. H. Cushing	200.00
Salary of Treasurer	100.00
Dentists of Galveston	100.00

Official Stenographer	125.00	
Printing and distributing Transactions 1899	162.38	
Exchange, stationery and postage	44.01	
International Dental Congress Committee	94.30	
Executive Committee	51.60	
Committee on Public Hygiene	50.00	
Section III	10.75	
		$1,944.64
Balance on hand		1,033.51
		$2,978.15

Respectfully submitted,

HENRY W. MORGAN, *Treasurer.*

Approved Aug. 6, 1901:

V. H. Jackson,
W. N. Cogan,
Charles McManus.

The Secretary read a letter from Mrs. Geo. H. Cushing, and by vote was directed to read same before main body; also one from the Galveston dentists.

A report from the Committee on National Library and Museum was read. On motion, it was recommended read before the main body.

Report of Committee on National Dental Museum and Library.

TO THE OFFICERS AND MEMBERS OF THE NATIONAL DENTAL ASSOCIATION: Since 1895 your Committee on National Dental Museum and Library has repeatedly emphasized in its reports the value and importance of the Army Medical Museum and Library—an institution founded and maintained by the Government, and recognized as the National collection of all branches of the Healing Art.

We have especially striven to impress the dental profession with the fact that it has here a rare opportunity to represent the condition of the art and science of dentistry, and that hundreds of thousands form their estimates of the value of the attainments of the

various specialties of medicine and surgery by comparing here their literature and exhibited specimens. The literature of the dental profession to date has been nearly completed through purchases, though the special effort made through our former reports to obtain everything lacking in the way of matter out of print, of journals and of society transactions, has been but partially successful.

Forty-seven dental journals are regularly subscribed for, and all first editions of books on dentistry are purchased. As later editions are not always purchased, they should be contributed by authors and publishers.

The several thousand Museum specimens accumulated through donations and purchases form a valuable nucleus, but this class of material can be obtained in sufficient quantity and variety only through constant interest and persistent effort on the part of members of our profession who are interested in its advancement.

A large measure of credit for success in securing many valuable donations for the Museum is due to Dr. Ottolengui, who visited the institution, wrote of its value in the editorial columns of the *Items of Interest* and acknowledged donations, many of which were illustrated from month to month in the *Items of Interest* before being forwarded to the Museum. By this means suitable credit was publicly given donors, attention was attracted to the subject, and the value of specimens which are too often thrown away was emphasized.

Everything pertaining to any branch of dental art or science is desirable, but there is a special need of pathological specimens, of methods of operating, or of treating fractures and other injuries of the face and jaws, with appliances used, and photographs or casts showing the results. Such contributions would prove of interest to the army surgeon, and of value to the army dental surgeon, as well as to civilian practitioners and the public generally.

One of the indirect effects of the effort to build up a worthy National Museum has been the stimulation of interest in college collections, and we hope this will lead to such a system of exchange as will result in furnishing the National with duplicates of every thing contained in the various local collections. The work of collecting is slow, but is going on constantly.

We have lost some valuable material bequeathed by wills containing conditions; it should be understood by all that bequests

must be made *without conditions*, or with only such conditions as are previously accepted and approved by the authorities.

We recommend continued interest and increased effort in behalf of this cause, and repeat that the estimate of the attainments of dentistry will be formed largely from the showing the profession makes here.

Respectfully submitted,

WMS. DONNALLY,
JOHN S. MARSHALL,
H. W. MORGAN.

It was voted that this report be adopted.

On motion, it was recommended that the Association pay Mr. Worman's railroad expenses.

A communication from Dr. Barrett regarding the St. Luke's Hospital case was received.

On motion, the communication was laid on the table.

On motion, it was recommended that Dr. J. S. Marshall's paper be made a special order for two o'clock.

Dr. W. E. Walker, Secretary of Section I, made his report, with the request that he be permitted to make a supplementary report later.

Report of Secretary of Section I.

SECTION I recommends having read in general session the following papers: "Where Will It End?" Dr. E. K. Wedelstaedt; "Splints for Retaining Loose Teeth," Dr. W. V-B. Ames; "The Relation of the Nasal Septum to Deformities of the Dental Arch," Dr. Nelson M. Black; papers by Drs. C. L. Goddard and G. V. I. Brown. This is but a partial report, as there are other papers not yet considered by the Section, and therefore permission is asked to make a further report later.

A multiplicity of duties during the past year has rendered it impossible to give the journals of our specialty that close and care-

ful reading necessary to a complete resume of all that has been placed on record during the year which has elapsed since our last meeting. This report is offered merely as a classified reference to a portion of the literature of the year on some of the subjects apportioned to this Section. Many of the papers were read previous to our last meeting, but not having been published until later are included in this sketch.

The matter which follows has been culled from twelve different periodicals of our specialty, and consists of the kernel of sixty-nine articles, with careful reference given to journal and page, and we hope will prove useful to those who may have missed some thought of the year through not studying twelve journal files. Although it is made as brief as possible and limited to the subjects comprised in the title of Section I, it is necessarily a little long, and therefore we pause for a moment, that those not interested, as for instance, journal editors, may retire.

Prosthetic Dentistry: Dr. Simpson, a Boston physician, maintains (1) that "artificial teeth" are injurious, primarily because they enable elderly people to eat food not suited to the period of life in which they naturally have no teeth, thus constituting a source of danger to the welfare of the organism. Edentulous old age, however, is unattractive and we shall doubtless long continue to exercise our prosthetic art in the esthetic replacement of the lost dental organs.

Dr. Geo. H. Wilson (2) makes the assertion that prosthesis is the greatest and should be the most exalted portion of our profession. He defines Prosthesis as "restoration," understanding by prosthetic dentistry a restoration of the lost tissues, functions and expression, "second only to the work of the Creator." He claims for prosthesis a higher rank than for operative dentistry, "because it requires more intelligence, patience, manipulative ability and skill, and is fraught with such dire consequences when improperly understood and practiced. The prosthetist must have some of the sense of color of the painter, much of the skill in modelling and carving of the sculptor, and the sense of proportion and harmony that belongs to all true artists."

Dr. C. F. Bunbury (3) discusses the subject of Esthetic Dental Prosthesis and the consideration to be given to age, physical development and temperament, and the study of the features. He points

out the importance of a good occlusion, not only for the comfort of the patient but also as an aid to the esthetist.

Dr. L. W. Skidmore (4) also discusses the subject of artistic prosthetic Dentistry.

Dr. E. J. Perry (5) writes on the Scientific Articulation and Occlusion of the Teeth, by the Bonwill method; the paper gave rise to an interesting discussion.

At the International Dental Congress Drs. Hesse (6) and Schwartz described quite similar methods of ascertaining the exact movements of the lower jaw.

The *Items of Interest* devotes a large amount of space in the January, February and March issues to a "Symposium of Teachers in the Dental Schools" on the Retention of Full Upper Dentures.

Continuous Gum Work: Dr. J. B. Beauman (7) contributes a method of strengthening this work by means of a network of wires, the porcelain body intermeshing with the wires in such manner as to add greatly to the strength of the plate.

Dr. L. P. Haskell (8) criticizes this suggestion, attributing his own great success to correct articulation, thus avoiding any undue strain. Dr. Beauman and Dr. Haskell both have an experience of fifty years in continuous gum work.

At the Alumni Clinic of the Chicago College of Dental Surgery, Dr. R. C. Brophy (9) demonstrated that the lack of electric heat was no bar to success in porcelain work, two continuous gum plates being baked in the clinician's gasoline furnace.

Aluminum as a Base: Dr. F. B. Clemmer (10) reports a case in which "flashes of light" were noticed on contact of an aluminum upper plate with amalgam fillings in the lower teeth, with an unpleasant metallic taste in the mouth. In the discussion of the case Dr. Nyman expressed the belief that such continued galvanic action would in time result in the disintegration of the plate, and recommended the removal of same or the removal of the fillings and covering the dentin with cement before replacing the fillings. It is claimed that a most beautiful finish is given to aluminum work by the use of caustic soda after the work has been vulcanized and finished (10a).

At the clinics of the Ohio State Dental Society (11) Dr. W. O. Hulick presented a casting flask for aluminum work, having a detachable pouring top. This portion is to be heated and placed over

the cold flask, the plate being thus cooled suddenly, all shrinkage taking place in the bulk of metal in the pouring gate.

Dr. Pachen (12) swages aluminum, using blocks of car-spring rubber as counter-die, thus keeping the surface free from scratches or blemishes. Finely cut up rubber is also used in the Parker swaging apparatus for swaging aluminum.

Models: Dr. H. C. Wetmore (13) claims for articulating models of fusible metal (from plaster impressions) the advantage of greater accuracy and greater despatch, four minutes being sufficient for the entire procedure, the plate being flasked and vulcanized in less time than is required for a plaster model to dry and harden.

Dr. E. C. Moore (14) discusses the subject of models from which metal dies are made.

Dr. E. W. Bridgeman (15) describes the method of stearinizing a cast, giving an almost stone-like texture, and a surface which will take a polish with a dry cloth; a cast which can be laid away with no fear of its being easily damaged.

Crown and Bridgework: Dr. J. O. Wells (16) traces the evolution of the artificial crown, finding that bridgework, however, is much more ancient, even antedating plates. The pivot crown with compressed wood for the post was the pioneer. The canal receiving no treatment, the frequency of abscesses did much to discourage the use of crowns until the introduction of modern antiseptic methods, the substitution of porcelain for human crowns and of metallic for wooden dowels.

Modern Ideal Crown work is portrayed by Dr. H. J. Goslee (17). The details of the construction of a porcelain bicuspid are given by Dr. M. L. Hanaford (18). Dr. Geo. Evans (19) gives in detail his method of cementing crown-dowels into a root in such manner that the crown may be removed in case of accident without injury to it.

Dr. H. L. Cruttenden (20) sets crowns with cement using a cement-syringe. A committee appointed by the Minnesota State Dental Society to time and report upon the operation reported the roots filled perfectly to the apex.

Dr. A. P. Burkhart (21) sets crowns with gutta-percha, as affording facilities for removal.

Dr. H. E. Fox (22) describes a case of resetting a broken-off natural crown on its own root. Dr. M. L. Rhein (23) that of sub-

stituting a porcelain root for an amputated, diseased natural root. Logan crowns are discussed, pro and con, with and without bands, etc. (24, 25, 26. 27). Dr. James P. Nichol (28) describes improved methods in backing a Richmond crown. Dr. Geo. W. Schwartz (29) details the method of building up porcelain crowns, and the preparation of the root for the reception of the crown, whether with or without band. Dr. Wm. A Spring (30) considers the importance of a proper biscuit bake for porcelain crowns, etc. Gold crowns with cemented porcelain faces are described by Dr. J. Clarence Salvas (31); Dr. Geo. Evans (32) demonstrates a method of facing metallic crowns with porcelain; Dr. N. H. Keyser (33) details his method of constructing seamless gold crowns with porcelain inlays or facings.

The legitimate place of the gold crown is discussed by Dr. Thos. A. Black (34); sectional versus seamless crowns by Dr. H. J. Goslee (35); the matrix for a seamless crown by Dr. J. H. Prothero (36); discussed by the Chicago Odontographic Society (37), and in a letter from Dr. H. C. Waack (38) defending his position. Dr. J. E. Nyman (39) describes his method of constructing a gold crown with carved solid cusps.

Bridgework: Some of the causes of failures in bridgework are discussed by Dr. Geo. S. Betts (40); Concealed Gold-bridge attachments, Dr. H. M. Kirke (41); a plan of attachment, J. P. Carmichael (42); a Method of Supporting Small Bridges, where full bands cannot be utilized, by hanging them to caps cemented upon the incisal ends of the teeth is shown by Dr. C. T. Whinnery (43). A Removable Bridge, for cases where the piers lean, using parallel slides, with corresponding slots affixed to the piers, is described by Dr. A. E. H. Lister (44). The advantages of one long bridge with numerous attachments over several short bridges with two attachments each, the roots not only holding the bridge, but the bridge also holding the roots so that they tighten in their sockets, is argued by Dr. A. W. McCandless (45). Dr. W. E. Griswold's System of Removable Bridgework has been received with marked appreciation at the different clinics where it has been demonstrated during the past year. The two-fold object of bridge and retainer for loose, lower anterior teeth (pyorrhea) is attained by the method described by Dr. C. S. Bradley (46).

Orthodontia: Dr. A. M. Jackson (47) offers suggestions in the

study of Orthodontia. Dr. L. Vichot (48) read a paper at the International Dental Congress on the Modifications brought about in the Bones of the Face as the Result of the Correction of Dental Irregularities. Dr. C. S. Case's paper on the Principles of Dento-Facial Orthopedia was illustrated by slides projected upon a screen. (See Trans.)

Dr. Douzille (49) offered a new hypothesis on the phenomena occurring in the osseous tissues in the process of tooth regulation, with a history of the experiments upon guinea pigs in proof of the correctness of his theory. He also presented a new appliance for the expansion of the lower jaw. Dr. DeLair presented a variety of appliances for facial restorations. Dr. Guerini reported the correction of an exceptionally marked case of prognathism by the extraction of the four incisors and the resection of the external alveolar border. Dr. W. E. Decker (50) contributes an illustrated paper on the progress of a case diagnosed and watched by the X-Ray. Dr. A. E. Matteson (51) presents an appliance designed to effect the forward movement of the apical third of an individual tooth, of which the incisive edge has been brought into correct position, the labial surface still being out of alignment.

A controversy on "Jumping the Bite," opened by Dr. R. Ottolengui in a paper read before the First District Dental Society of New York and published; together with the discussion, in the *Dental Cosmos*, February, and discussed again August, 1900 (page 143, 171-9), with a rejoinder by Dr. E. S. Talbot, published in the *International Dental Journal*, March, 1900 (page 158), has been continued during the past year by conclusive evidence by Dr. Ottolengui (52), read before and discussed by the New York Odontological Society, and an editorial on the subject by the same author (53). Cases of Jumping the Bite are described by Dr. C. D. Lukens (54), Dr. Gonsalves (55), Dr. Wm. Ernest Walker (56), Dr. Wm. H. Schulze (57), Dr. Eben Flagg (58), and Dr. E. S. Talbot "Unilateral Jumping the Bite" (59).

A paper entitled "Simple Methods in Orthodontia," by Dr. C. E. Kells, Jr. (60), called forth a reply by Dr. Richard Summa (61), a reply by Dr. Kells (62), a criticism of the editor and a reply by him (63), and a second reply by Dr. Summa (64), A Case in Practice, by Dr. Kells (65), also properly belongs to this series of papers.

Dr. Thomas B. Mercer (66) presented a paper, entitled "Nor-

mal Occlusion as a Basic Principle in Orthodontia," which was discussed by the Minnesota State Dental Association. Dr. H. A. Pullen (67) shows the application of the Bonwill law in every-day practice. Dr. J. H. Milliner (68) contributed a paper on Adenoid Vegetations and Their Influence on the Palatal Arch. At the International Dental Congress Dr. Poinsot (69) also read a paper on "The Relation of Adenoid Tumors to the Development of the Maxillae." (The literature on the subjects of Metallurgy and Chemistry is omitted from this review, the foregoing being sufficient to occupy the time allotted to this portion of the program.)

Following are the journals, number and page, above referred to:

1. Southern Dental Journal, October, p. 405. 2. Dental Register, April, p. 161. 3. Dental Digest, June, p. 393. 4. Dental Digest, April, p. 247. 5. Dental Review, pp. 95, 146-162. 6. Dental Cosmos, October, p. 1004. 7. Ohio Dental Journal, November, p. 498. 8. Dental Cosmos, January, p. 26. 9. Dental Review, February, p. 168. 10. Dental Review, December, p. 993. 10a. Items of Interest, April, p. 307. 11. Dental Register, March, p. 143. 12. Dental Register, March, p. 144. 13. Dominion Dental Journal, February, p. 47. 14. Dental Register, April, p. 163. 15. Pacific Dental Gazette, September, p. 622. 16. Dental Review, May, p. 423. 17. Dental Cosmos, January, p. 10. 18. Dental Review, March, p. 226. 19. Dental Office and Laboratory, November, p. 187. 20. Dental Review, February, p. 114. 21. Dental Cosmos, April, p. 409. 22. Pacific Dental Gazette, April, p. 225. 23 Dental Digest, January, p. 59. 24. Dental Review, February, p. 111. 25. Dental Digest, November, p. 842. 26. Dental Digest, December, p. 903. 27. Dental Digest, March, p. 158. 28. Dental Cosmos, September, p. 877. 29. Dental Review, August, p. 591. 30. International Dental Journal, May, p. 301. 31. Dental Cosmos, April, p. 409. 32. Dental Cosmos, March, p. 300. 33. Dominion Dental Journal, February, p. 46. 34. Dental Cosmos, August, p. 810. 35. Dental Brief, March, p. 155. 36. International Dental Journal, November, p. 762. 37. Dental Brief, January, p. 7. 38. Dental Cosmos, February, p. 113. 39. Items of Interest November, p. 801. 40. Dental Headlight, October-December, pp. 160. 41. Ohio Dental Journal, February, p. 79. 42. Dental Review, January, p. 82. 43. Dental Register, March, p. 144. 44. Items of Interest, November, p. 799. 45. Dental Review, March, p. 230. 46. Dental Digest, May, p. 324. 47. Dental World, November, p. 19. 48. Dental Cosmos, November, p. 1195. 49. Dental Cosmos, June, pp. 605, 633-636. 50. International Dental Journal, March, pp. 141, 185. 51. Dental Review, October, 796. 52. Dental Cosmos, September, 843, 883-886. 53. Items of Interest, October, p. 777. 54. Items of Interest, September, p. 670. 55. Items of Interest, September, 679. 56. Items of Interest, September, p. 693. 57. Items of Interest, January, p. 29. 58 Dental Brief, April, p. 193. 59. International Dental Journal, May, p. 315. 60. Items of Interest, September, p. 653. 61. Items of Interest, December,

p. 896. 62. Items of Interest, February, p. 95. 63. Items of Interest, March, pp. 16, 166. 64. Items of Interest, April, p. 250. 65. Dental Review, December, p. 950. 66. Dental Review, May, pp. 401, 437. 67. Dental Digest, January, p. 1. 68. Dental Cosmos, April, p. 404. 69. Dental Cosmos, April, 379.

WM. ERNEST WALKER, *Secretary.*

On motion, the report was accepted and the request granted.

Report of Committee on Necrology was received, and by vote was directed read before the main body.

On motion, adjourned to meet Thursday morning.

Thursday morning session was called to order by Dr. H. J. Burkhart at 10 o'clock.

Minutes of previous session were read and approved.

The following communication from Dr. A. H. Fuller was read:

To the National Dental Association:

Whereas, The National Dental Association, now in convention assembled, learns with pleasure that an international exposition is to be held in St. Louis in 1903, commemorating the purchase of all that body of land known as the Territory of Louisiana;

Whereas, It is a matter of public information that the Congress of the United States has set its seal of approval by appropriating five millions of dollars and has set aside an additional sum of two hundred and fifty thousand dollars for a permanent government building and exhibit, and that the people of Missouri have amended their Constitution and appropriated one million of dollars for the State's exhibit;

Whereas, The citizens and municipality of St. Louis have appropriated ten millions of dollars;

Whereas, The site has been selected and approved by the Commission appointed by the President of the United States, and work in all departments is progressing rapidly and the success of the enterprise is abundantly assured;

Resolved, That the National Dental Association hereby heartily endorses this as a national and international exposition and declares in favor of uniting with the citizens of St. Louis and the Louisiana Purchase in securing a display of the progress made in one hundred years in all that pertains to science, education, peace, prosperity and happiness of a great nation. That this Association wishes to be placed on record as in favor of holding its annual convention in St. Louis during the progress of the great fair in 1903.

Respectfully, A. H. FULLER.

On motion it was decided that the provisions in the communication were in conflict with the Constitution, and action thereon was deferred.

Report of Publication Committee was read, and, on motion, was accepted.

The Publication Committee would submit the following report:

Your Committee were informed by the Executive Council at the close of the last meeting that arrangements had been made for the publication of the transactions by the S. S. White Dental Manufacturing Company.

The transactions of 1900 were mailed to those entitled to receive them, including societies, libraries and honorary members, on July 31, 1901.

Your Committee is unable to state why this extraordinary delay occurred. No amount of urging had the slightest effect in hastening the work, and no inquiries as to the cause of the delay elicited any explanation. The transactions should have been issued not later than the first of January, 1901, as the entire copy was in the hands of the publishers about the middle of October, 1900.

Unless the transactions are in the hands of the members a reasonable length of time previous to the next annual meeting the value is very largely lost to the latter.

The Chairman of the Committee has during the past three or four months received many letters of inquiry about the transactions, in which much disappointment has been expressed because of the delay in their issuance.

The Committee would recommend that some arrangement be made whereby the transactions shall be published in book form not later than January 1 following the close of the meeting.

A. H. Peck, *Chairman.*

On motion, the Secretary was voted four hundred dollars salary, and the Treasurer one hundred dollars salary.

Report of A. W. Harlan, Chairman of Committee on International Dental Congress was read.

On motion, it was accepted and ordered printed.

Report of Committee on the International Dental Congress, Paris, 1900.

Mr. President and Gentlemen: The Committee appointed by the National Dental Association at its meeting held in Omaha, Neb., in 1898, was composed of the following members: A. W. Harlan, Chairman, Chicago. W. E. Griswold.

Sec'y, Denver. Truman W. Brophy, Chicago. Thos. E. Weeks, Minneapolis. L. L. Dunbar, San Francisco. C. L. Goddard, San Francisco. W. C. Barrett, Buffalo. W. W. Walker, New York. Thos. Fillebrown, Boston. James McManus, Hartford, Conn. E. C. Kirk, Philadelphia. Frank Holland, Atlanta. J. D. Patterson, Kansas City. A. H. Fuller, St. Louis. H. J. McKellops, St. Louis. B. Holly Smith, Baltimore. H. A. Smith, Cincinnati. J. Taft, Cincinnati. H. S. Sutphen, Newark, N. J. Geo. H. Chance, Portland, Ore. Wm. Jarvie, Brooklyn. H. W. Morgan, Nashville.

At the first meeting held at Niagara Falls in August, 1899, the undersigned was selected as Chairman, and W. E. Griswold of Denver, was chosen Secretary.

A sub-committee was appointed to select clinicians and essayists, and met at the Palmer House in October, 1899, with the following persons present: T. W. Brophy, W. C. Barrett, E. C. Kirk, H. A. Smith, W. E. Griswold, A. W. Harlan. At that meeting the following members of the profession were selected to represent the United States by reading papers:

W. A. Price, D.D.S., Cleveland. "The Science of Dental Radiography."

Richard Grady, M.D., D.D.S., Baltimore. "Instructing Our Patients in the Care of the Mouth and Teeth."

R. R. Andrews, A.M., D.D.S., Cambridge, Mass. "The Development of the Enamel."

G. W. Cook, D.D.S., Chicago. "A Bacteriological Study of Pyorrhea Alveolaris."

C. S. Case, D.D.S., Chicago. "Important Principles in Dento-facial Deformities."

J. E. Hinkins, D.D.S., Chicago. "The Chemical Action of Cements in the Mouth."

T. W. Brophy, M.D., D.D.S., Chicago. "Surgical Treatment of Palatal Defects."

A W. Harlan, A.M., M.D., D.D.S., Chicago. "Pulp Digestion."

E. R. Warner, M.D., D.D.S., Denver. "Some Phases of Mummification."

J. W. Wassall, M.D., D.D.S., Chicago. "Personal Hygiene."

John F. Dowsley, D.D.S., Boston. "Dental Legislation in America."

M. L. Rhein, M.D., D.D.S., New York. "Heteroplasty Following Root Amputations."

R. H. Hofheinz, D.D.S., Rochester, N. Y. "The Defects in Preliminary Education."

A. H. Thompson, D.D.S., Topeka, Kas. "The Phylogeny of the Fifth Tubercle in the Second Inferior Molar of Man."

The following gentlemen gave clinics and demonstrations:

W. V. B. Ames, D.D.S.. Chicago. "Some Possibilities of New Process Oxyphosphate of Copper."

Gordon White, D.D.S., Nashville. "A Compound Filling Using in the Cavity Tin, Abbey's Non-cohesive Gold and Nickold's Cohesive Gold."

Joseph Head, M.D., D.D.S., Philadelphia. "Porcelain Inlays."

Alfred Owre, M.D., D.D.S., Minneapolis. "Preparing a Step Cavity in an Incisor or Bicuspid and Filling Same with DeTrey's Crystal Mat Gold."

Joseph W. Wassall, M.D., D.D.S., Chicago. "The Treatment of Septic Pulpless Teeth."

Robt. Good, D.D.S., Chicago. "Porcelain Bridgework."

V. H. Jackson, M.D., D.D.S., New York. "Jackson's System of Constructing Appliances for the Correction of Irregularities of the Teeth."

Levitt E. Custer, D.D.S., Dayton, O. "The Electric Oven and Electric Gold Annealer."

W. E. Griswold, D.D.S., Denver. "A Removable Crown for the Support of Saddle Plates and Bridges."

E. K. Wedelstaedt, D.D.S., St. Paul. "Gold Filling, Mesio-occlusal Cavity in Upper First Molar, Demonstrating Dr. G. V. Black's Method of: 1, Cavity Preparation; 2, Extension for Prevention; 3, Occlusal Anchorage; 4, The use of Annealed and Unannealed Gold; 5, Method of Finishing (using the Black saw and finishing files); 6, Proper Contact; also 7, the Scientific Application of the Rubber-Dam, and 8, the Wedelstaedt system of Measurement and Its Application to Cavities in the Human Teeth."

T. W. Brophy, M.D., D.D.S., L.L.D., Chicago. "Surgical Treatment of Congenital Cleft Palate."

In addition to the reading of papers and giving clinics six of

the representatives of the United States were made honorary Chairmen of Sections: Drs. E. C. Kirk, T. W. Brophy, C. S. Case, W. W. Walker, Gordon White and W. E. Griswold. After the close of the Congress two important Committees were appointed: The first to provide for the next International Dental Congress in 1905, and the writer was selected as a member of the Executive Committee to represent the United States. That Committee will meet in Cambridge, England, August of this year, and as I am to attend the meeting, this will explain my absence to-day. The second committee was selected to provide a scheme for an International Dental Federation to study methods of teaching and unify them. Delegates are expected from nearly all countries. Drs. T. W. Brophy and E. C. Kirk were appointed in behalf of this country, and they will attend that meeting.

It is hoped that this Association will ratify these appointments, so that the work of organizing the next Congress may go on and the international educational work laid out for this Committee will receive your full support and co-operation.

There were ninety members of the profession present in Paris who became members, and the total aggregated more than twelve hundred and fifty.

The work of this Congress has received favorable comment from nearly all journals and many of the papers were of such interest that they have been translated into all languages.

There are no bills to be paid, as the members of the Committee paid their own expenses. Respectfully submitted,

A. W. Harlan, *Chairman.*

W. E. Griswold, *Secretary.*

A cablegram from the British Dental Association, conveying greetings, was received and read.

On motion, the Secretary was directed to reply by cable.

Resignation of Dr. C. A. Brackett was read and, on motion, was accepted.

The report of Committee on Oral Hygiene was taken up for consideration.

On motion, the report was referred to the Publication Committee.

It was moved by Dr. B Holly Smith that the Association repudiates and resents the statements of the press that a member was hissed off the floor, for it is not in accordance with the facts. Motion carried.

The following resolution was presented by Dr. B. Holly Smith:

Resolved, That this Association express its appreciation of the labors and sacrifices of Dr. Wms. Donnally in furthering the passage of the law creating the Army and Navy Dental Corps.

On motion, resolution was adopted.

On motion, adjourned to meet Thursday evening.

Thursday evening session was called to order by the President at 7:30 o'clock.

Minutes of previous session were read and approved.

On motion, it was recommended that an amount, not to exceed one thousand dollars, be appropriated to the fund for the suppression of fraudulent diploma mills.

Dr. J. A. Libbey, on behalf of the Committee on Army and Navy legislation, reported that the work of the Committee was completed and recommended that the Association appropriate as much money as can be afforded to Dr. Wms. Donnally for expenses incurred.

A communication from Mr. F. L. Hise regarding publication of transactions was read; also a communication from Dr. Crouse on the same subject.

On motion, the proposition of Dr. Crouse, on behalf of the DENTAL DIGEST, was accepted, on condition that he shall give a bond of five hundred dollars, binding himself to comply with the conditions.

On motion, the Secretary was authorized to supply a copy of proceedings at as early a date as possible and exact said bond of Dr. Crouse, that proceedings shall appear in book form three months thereafter.

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College of Dental and Oral Surgery of New York
302 East 38th Street
New York

On motion, the election of officers was made a special order for 11 o'clock Friday morning.

On motion, adjourned to meet Friday morning.

Friday morning session was called to order by Dr. H. J. Burkhart at 10 o'clock.

Minutes of the previous session were read and approved.

Report of Committee on Credentials was presented.

A form for a credential certificate was submitted by the Committee on Credentials.

On motion, the form was adopted and the Secretary was directed to have a number printed.

National Dental Association Delegate's Certificate.

This is to certify that . . . . . a graduate of . . . . . , has been duly elected to represent the . . . . . at the annual convention of the National Dental Association to be held at . . . . . .

Said delegate is a member in good standing, and said Society has adopted a code of ethics practically in accord with that of the National Dental Association.

. . . . . President.

. . . . . Secretary.

Bills as presented by Committee on Credentials were ordered paid.

On motion, Committee on Credentials was instructed to read the names of delegate members before the main body.

To the Executive Council of the National Dental Association.

Your committee on credentials respectfully reports that they have examined and approved the credentials presented by delegates representing the following societies and colleges:

California State Association—Dr. J. A. Cronkhite, Los Angeles.

Connecticut State Dental Association—Dr. Charles McManus, Hartford; Dr. James McManus, Hartford; Dr. Alfred C. Fones, Bridgeport.

Colorado State Dental Association—Dr. H. F. Hoffman, Denver; Dr. H. A. Fynn, Denver.

Chicago Dental Society—Dr. Geo. W. Pitts, Dr. F. B. Moorehead, Dr. Arthur D. Black.

Denver Dental Association—Dr. H. F. Hoffman, Dr. H. A. Fynn.

District of Columbia Dental Society—Dr. H. J. Allen, Washington; Dr. Wms. Donnally, Washington; Dr. H. C. Thompson, Washington; Dr. W. N. Cogan, Washington; Dr. M. F. Finley, Washington.

Georgetown University Medical School, Dental Department—Dr. W. N. Cogan, Washington..

Harvard Odontological Society—Dr. Chas. E. Parkhurst, Boston; Dr. Waldo E. Boardman, Boston.

Illinois State Dental Society—Dr. F. B. Noyes, Chicago; Dr. S. A. Campbell, Chicago; Dr. F. W. Gethro, Chicago; Dr. J. T. Cummins, Metropolis; Dr. R. N. Laurance, Lincoln; Dr. A. E. Matteson, Chicago; Dr. Chas. N. Thompson, Chicago; Dr. J. B. Dicus, Chicago; Dr. E. L. Oldfield, Chicago; Dr. E. K. Blair, Waverly; Dr. C. B. Powell, Jacksonville; Dr. D. M. Cattell, Chicago; Dr. Grafton Munroe, Springfield; Dr. E. F. Hazell, Springfield; Dr. E. H. Allen, Freeport; Dr. J. E. Hinkins, Chicago; Dr. C. L. Smith, St. Charles; Dr. L. L. Davis, Chicago; Dr. C. B. Sawyer, Jacksonville; Dr. J. E. Keefe, Chicago; Dr. Josephine D. Pfeiffer, Chicago.

Indiana Dental Society—Dr. Robt. T. Oliver, War Dept., U. S. Army, Washington.

Iowa State Dental Society—Dr. J. W. Shankland, Pella; Dr. A. R. Begun, Des Moines; Dr. B. C. Hinkley, Keokuk; Dr. H. R. Thill, Dubuque; Dr. J. L. Taylor, Dubuque; Dr. C. S. Searles, Dubuque; Dr. W. Cole, Postville; Dr. R. S. Bandy, Tipton; Dr. Geo. H. Belding, Calmar.

Kansas State Dental Association—Dr. C. E. Esterly, Lawrence; Dr. J. P. Root, Kansas City.

Maryland State Dental Association—Dr. Richard Grady, Baltimore.

Maine Dental Society—Dr. Thomas Fillebrown, Portland.

Massachusetts State Dental Society—Dr. Henry P. Cooke, Worcester; Dr. Chas. E. Parkhurst, Boston; Dr. Waldo E. Boardman, Boston; Dr. Geo. A. Savage, Worcester; Dr. John F. Dowsley, Boston; Dr. Murdock C. Smith, Lynn; Dr. D. Hurlbut Allis, Springfield.

Michigan State Dental Association—Dr. E. T. Loeffler, Saginaw, W. S.; Dr. C. J. Hand, Romeo; Dr. H. C. Raymond, Detroit; Dr. E. A. Honey, Kalamazoo; Dr. A. C. Runyan, South Haven.

Milwaukee Odontological Society—Dr. Arthur Holbrook, Dr. Edwin A. Geilfuss.

Milwaukee Odontographic Society—Dr. R. J. Wenker, Dr. C. W. Hall, Dr. F. H. Emmerling, Dr. E. J. Eisen.

Minnesota State Dental Association—Dr. Alfred Owre, Minneapolis; Dr. Clayton H. Stearns, Owatonna; Dr. A. E. Peck, Minneapolis; Dr. G. A.

Rawlings, Bismarck, N. D.; Dr. H. L. Cruttenden, Northfield; Dr. E. B. Weeks, Litchfield.

Missouri State Dental Association—Dr. Otto J. Fruth, St. Louis; Dr. Burton L. Thorpe, St. Louis; Dr. L. J. McKellops, St. Louis; Dr. C. D. Lukens, St. Louis.

Nebraska State Dental Society—Dr. W. Clyde Davis, Lincoln; Dr. Leah Mills, Omaha.

New Jersey State Dental Society—Dr. J. Allen Osmun, Newark, N. J.

New York State Dental Society—Dr. Henry H. Tompkins, Utica.

New York Institute of Stomatology—Dr. E. A. Bogue, New York; Dr. Chas. O. Kimball, New York.

Odontographic Society of Chicago—Dr. Geo. N. West, Dr. W. T. Reeves.

Ohio State Dental Society—Dr. G. S. Junkerman, Cincinnati.

Oregon State Dental Association—Dr. Herbert C. Miller.

Pennsylvania College of Dental Surgery—Dr. Wilbur F. Litch, Philadelphia.

Pennsylvania State Dental Society—Dr. W. J. Roe.

Southern Wisconsin Dental Association—Dr. C. W. Collver, Clinton; Dr. E. J. Schleif, Milwaukee; Dr. T. M. Welch, Waupun.

Tennessee Dental Association—Dr. D. R. Stubblefield, Nashville; Dr. Henry W. Morgan, Nashville.

Washington State Dental Society—Dr. W. A. Wright, Spokane.

Wisconsin State Dental Society—Dr. P. B. Wright, Milwaukee; Dr. J. T. Stuart, Milwaukee; Dr. W. H. Carson, Milwaukee; Dr. Louis R. Esau, Milwaukee; Dr. Jacob Senty, Prairie du Sac; Dr. H. R. Soulen, Phillips; Dr. E. C. French, Eau Claire; Dr. A. P. Nicholson, Edgerton; Dr. F. J. Meyer, Sauk City.

Respectfully submitted,

V. H. Jackson,
W. N. Cogan,
Charles McManus.

On motion, an appropriation of five hundred dollars was made to Dr. Wms. Donnally to reimburse him for expenses incurred in connection with the Army and Navy Bill.

On motion, adjourned to meet after election of officers.

Council was called to order by Dr. H. J. Burkhart at 12:30 o'clock.

On motion, Dr. Burkhart was elected Chairman of Executive Council.

On motion, Secretary was instructed to receive the final report of Local Committee of Arrangements.

Statement of Receipts and Disbursements of Committee on Local Arrangements :

RECEIPTS FOR 1901.

Wright Drug Co.	$ 50.00	
M. F. Patterson	50.00	
Union Dental Mfg. Co.	25.00	
Hotel Association	354.43	
		$479.43

DISBURSEMENTS.

Badges and Souvenirs of Milwaukee		$254.20	
Coaches		95.00	
Printing signs, placards, etc		29.55	
Clerks, porters and janitor service		22.25	
Extra chairs		6.00	
Blackboard, $1.00, lantern, $35.00		36.00	
Stenographer	$15.00		
Car fare, telegrams, postage, etc	16.00		
Expenses of Oral Surgery Clinic	25.00		
	$56.00		
In order to make statement balance these items are lumped in by committee at		$ 36.43	
			$479.43

Respectfully submitted,
GEO. V. I. BROWN, *Chairman.*

The Auditing Committee made the following report, which was concurred in :

To the Executive Council of the National Dental Association:

Your Auditing Committee have examined and approved all accounts of the Association that have been presented to date.

V. H. JACKSON,
W. N. COGAN,
CHAS. MCMANUS,
Committee.

Aug. 9, 1901.

On motion, the President was given power to appoint a Chairman of Clinic Committee.

Minutes of present session were read and approved.

On motion, Council adjourned.

A. H. PECK, *Recording Secretary.*

APPENDIX.

EX-PRESIDENTS OF THE AMERICAN DENTAL ASSOCIATION.

1859*	W. W. Allport	Chicago, Ill.
1860	W. H. Atkinson	Cleveland, Ohio.
1861	No meeting.	
1862	George Watt	Xenia, Ohio.
1863	W. H. Allen	New York, N. Y
1864	J. H. McQuillen	Philadelphia, Pa.
1865	C. W. Spalding	St. Louis, Mo.
1866	C. P. Fitch	New York, N. Y.
1867	A. Lawrence	Lowell, Mass.
1868	Jonathan Taft	Cincinnati, Ohio.
1869†	Homer Judd	St. Louis, Mo.
1870	W. H. Morgan	Nashville, Tenn.
1871	Geo. H. Cushing	Chicago, Ill.
1872	P. G. C. Hunt	Indianapolis, Ind.
1873	T. L. Buckingham	Philadelphia, Pa.
1874	M. S. Dean	Chicago, Ill.
1875	A. L. Northrop	New York, N. Y.
1876	Geo. W. Keely	Oxford, Ohio
1877	F. H. Rehwinkel	Chillicothe, Ohio.
1878	H. J. McKellops	St. Louis, Mo.
1879	L. D. Shepard	Boston, Mass.
1880	C. N. Peirce	Philadelphia, Pa.
1881	H. A. Smith	Cincinnati, Ohio.
1882	W. H. Goddard	Louisville, Ky.
1883	E. T. Darby	Philadelphia, Pa.
1884	J. N. Crouse	Chicago, Ill.
1885	W. C. Barrett	Buffalo, N. Y.
1886	W. W. Allport	Chicago, Ill.
1887	Frank Abbott	New York, N. Y.
1888	C. R. Butler	Cleveland, Ohio.
1889	M. W. Foster	Baltimore, Md.
1890	A. W. Harlan	Chicago, Ill.
1891	W. W. Walker	New York, N. Y.
1892	J. D. Patterson	Kansas City, Mo.
1893	Formal session only, owing to the holding of the World's Columbian Dental Congress; officers elected in 1892 held over until 1894.	
1894	J. Y. Crawford	Nashville, Tenn.
1895	J. Y. Crawford	Nashville, Tenn.
1896	Jas. Truman	Philadelphia, Pa.

*First meeting, for organization.

†Owing to a change in the Constitution, officers elected at this and the sessions following served at the next annual meeting subsequent to their election.

EX-PRESIDENTS OF THE SOUTHERN DENTAL ASSOCIATION.

1869*	W. T. Arrington	Memphis, Tenn.
1870	W. T. Arrington	Memphis, Tenn.
1871	Jas. S. Knapp	New Orleans, La.
1872	F. Y. Clark	Savannah, Ga.
1873	H. M. Grant	Abingdon, Va.
1874	Robt. Arthur	Baltimore, Md.
1875	J. R. Walker	New Orleans, La.
1876	W. T. Arrington	Memphis, Tenn.
1877	W. G. Redmond	Louisville, Ky.
1878	S. J. Cobb	Nashville, Tenn.
1879	F. J. S. Gorgas	Baltimore, Md.
1880	J. B. Patrick	Charleston, S. C.
1881	V. E. Turner	Raleigh, N. C.
1882	E. S. Chisholm	Tuscaloosa, Ala.
1883	L. D. Carpenter	Atlanta, Ga.
1884	H. J. McKellops	St. Louis, Mo.
1885	A. O. Rawls	Lexington, Ky.
1886	W. C. Wardlaw	Augusta, Ga.
1887	W. W. H. Thackston	Farmville, Va.
1888	B. H. Catching	Atlanta, Ga.
1889	J. Y. Crawford	Nashville, Tenn.
1890	John C. Storey	Dallas, Tex.
1891	G. F. S. Wright	Georgetown, S. C.
1892	Gordon White	Nashville, Tenn.
1893	B. Holly Smith	Baltimore, Md.
1894	Same officers hold over.	
1895	H. E. Beach	Clarksville, Tenn.
1896	John S. Thompson	Atlanta, Ga.
1897	W. H. Richards	Knoxville, Tenn.
1898†	E. P. Beadles	Danville, Va.

*First meeting, for organization; Jas. S. Knapp, Chairman *pro tem.*

†First President of the Southern Dental Association as a branch of the National Dental Association, organized August, 1897, by the consolidation of the American Dental Association and the Southern Dental Association.

LIST OF OFFICERS.

PRESIDENT—J. A. Libbey, 524 Penn Ave., Pittsburg, Pa.

VICE-PRESIDENT—East—S. H. Guilford, 1728 Chestnut St., Philadelphia, Pa.

VICE PRESIDENT—South—L. G. Noel, 527½ Church St., Nashville, Tenn.

VICE-PRESIDENT—West—W. P. Dickinson, Andrus Building, Minneapolis, Minn.

RECORDING SECRETARY—A. H. Peck, 92 State St., Chicago, Ill.

CORRESPONDING SECRETARY—Josephine D. Pfeiffer, Masonic Temple, Chicago, Ill.

TREASURER—Henry W. Morgan, 211 N. High St., Nashville, Tenn.

EXECUTIVE COMMITTEE.

J. D. Patterson, *Chairman*.....Keith and Perry Building, Kansas City, Mo.

FIRST DIVISION—COMMITTEE OF ARRANGEMENTS.

J. D. Patterson.....Keith and Perry Building, Kansas City, Mo.
C. N. Johnson.....Marshall Field Building, Chicago, Ill.
H. A. Smith.....116 Garfield Place, Cincinnati, O.

SECOND DIVISION—COMMITTEE ON CREDENTIALS AND AUDITING.

V. H. Jackson.....240 Lenox Ave., New York, N. Y.
T. S. Waters.....756 N. Eutaw St., Baltimore, Md.
W. N. Cogan.....1746 "M" St , N. W., Washington, D. C.

THIRD DIVISION—COMMITTEE ON VOLUNTARY ESSAYS.

C. S. Butler..... 680 Main St., Buffalo, N. Y.
G. V. I. Brown.....Milwaukee Medical College. Milwaukee, Wis.
T. P. Hinman.....22½ S. Broad St., Atlanta, Ga.

Executive Council.

H. J. Burkhart, *Chairman*.....Batavia, N. Y.
B. Holly Smith.....1007 Madison Ave., Baltimore, Md.
J. Y. Crawford.....Jackson Building, Nashville, Tenn.
M. F. Finley.....1928 "I" St., N. W., Washington, D. C.
C. C. Chittenden.....Madison, Wis.
(J. A. Libbey, A. H. Peck *ex-officio* members.)

Section I—Prosthetic Dentistry, Crown and Bridgework, Metallurgy, Chemistry and Orthodontia.

Hart J. Goslee, *Chairman*.....Ashland Boul. and Madison St., Chicago, Ill.
W. E. Walker, *Secretary*.....New Orleans, La.

Section II—Dental Education, Literature, Nomenclature, Histology and Microscopy.

S. H. Guilford, *Chairman*.....1728 Chestnut St., Philadelphia, Pa.
M. F. Finley, *Secretary*.....1928 "I" St., N. W., Washington, D. C.

Section III—Operative Dentistry, Materia Medica and Therapeutics.

D. M. Cattell, *Chairman*.....100 State St., Chicago, Ill.
F. B. Noyes, *Secretary*.....92 State St., Chicago, Ill.

Section IV—Physiology, Etiology, Hygiene, Prophylaxis and Electricity.

J. D. Patterson, *Chairman*.....Keith and Perry Building, Kansas City, Mo.
Emma Eames Chase, *Secretary*.....3334 Washington Ave., St. Louis, Mo.

Section V—Anatomy, Pathology and Surgery.

Thos. Fillebrown, *Chairman*.....157 Newbury St., Boston, Mass.
W. H. G. Logan, *Secretary*.....785 Winthrop Ave., Chicago, Ill

Seotion VI—Clinics.

Robert H. Nones, *Chairman*.....1708 Chestnut St., Philadelphia, Pa.
W. D. Tracy, *Secretary*.....46 W. 37th St., New York, N. Y.

Committee on History.

Chas. McManus, *Chairman*.....80 Pratt St., Hartford, Conn.
H. L. Ambler.....176 Euclid Ave., Cleveland, O.
Gordon White.....610½ Church St., Nashville, Tenn.
Jonathan Taft.....Berkshire Building, Cincinnati, O.
H. B. Noble.....1324 New York Ave., Washington, D. C.

Committee on International Relations as to Diplomas.

J. N. Crouse, *Chairman*.....2231 Prairie Ave., Chicago.
Gordon White.....610½ Church St., Nashville, Tenn.
R. Ottolengui.....115 Madison Ave., New York, N. Y.

Committee on Army and Navy Legislation.

M. F. Finley, *Chairman*.....1928 "I" St., N. W., Washington, D. C.
Wms. Donnally, *Secretary*.....1022 14th St., N. W., Washington, D. C.
C. S. Butler.....680 Main St., Buffalo, N. Y.
T. T. Moore.....1429 Main St., Columbia, S. C.
Robert Huey.....330 S. 15th St., Philadelphia, Pa.
Gordon White.....610½ Church St., Nashville, Tenn.

Committee on National Dental Museum and Library.

Wms. Donnally, *Chairman*.....1022 14th St., N. W., Washington, D. C.
Henry W. Morgan.....211 N. High St., Nashville, Tenn.
John S. Marshall.....Columbus Memorial Building, Chicago, Ill.

Committee on Oral Hygiene in Public Schools.

Richard Grady, *Chairman*.....Naval Academy, Annapolis, Md.
H. H. Johnson.....306 Second St., Macon, Ga.
W. E. Walker.....New Orleans, La.
I. P. Wilson.....327 N. Fourth St., Burlington, Ia.
Frank W. Stiff.....2101 Church Hill Ave., Richmond, Va.

Committee on Necrology.

Jonathan Taft, *Chairman*.....Berkshire Building, Cincinnati, O.
W. E. Boardman.....184 Boylston St., Boston, Mass.
E. S. Gaylord.....63 Trumbull St., New Haven, Conn.

Publication Committee.

A. H. Peck.....92 State St., Chicago, Ill.
G. V. I. Brown.....Milwaukee Medical College, Milwaukee, Wis.
Thos. L. Gilmer.....Marshall Field Building, Chicago, Ill.

Committee to Arouse Interest in and Cooperation of the Various Local and State Societies in the Work of the National Association.

Jonathan Taft, *Chairman*.....Berkshire Bldg., Cincinnati.
Henry W. Morgan.....211 N. High St., Nashville.
Chas. McManus.....80 Pratt St., Hartford, Conn.

COMMITTEE TO SUPERINTEND THE EXPENDITURE OF THE APPROPRIATION TO THE FUND FOR THE SUPPRESSION OF "FRAUDULENT DIPLOMA MILLS."

H. J. Burkhart, *Chairman*.....Batavia, N. Y.
C. N. Johnson.....Marshall Field Bldg., Chicago.
A. R. Melendy..... Knoxville, Tenn.

ORGANIZATION OF SECTIONS.

SECTION I. Prosthetic Dentistry, Crown and Bridgework, Metallurgy, Chemistry and Orthodontia.

Hart J. Goslee, Chairman; W. E. Walker, Secretary; Maurice Albrecht, D. H. Allis, W. V-B. Ames, H. S. Abendschein, Chas. L. Babcock, W. H. Baird, J. R. Beach, E. K. Blair, R. Boyd Bogle, W. E. Burkhart, C. S. Case, J. W. Cannaday, B. J. Cigrand, Gordon H. Claude, Wm. Conrad, W. N. Cogan, James A. Cronkhite, J. Y. Crawford, J. A. Dale, Lewellyn F. Davis, W. W. Evans, Geo. Evans, Otto J. Fruth, J. N. Farrar, C. H. Frink, Walter H. Fundenberg, W. E. Grant, A. H. Gilson, S. E. Gilbert, A. J. Gross, Mary E. Gallup, L. S. Gilbert, C. L. Goddard, Joseph Head, J. Searle Hurlbut, J. A. Hall, Chas. L. Hungerford, W. S. How, R. J. Hart, V. H. Jackson, H. H. Johnson, H. H. Jackson, C. R. Jeffries, Ed. M. Kettig, J. H. Kennerly, M. A. Knapp, J. R. Knapp, W. F. Litch, C. D. Lukens, A. E. Matteson, F. J. Maynard, Henry McManus, A. R. Melendy, A. J. McDonald, Geo. W. Miller, H. B. Noble, R. Ottolengui, Alfred Owre, J. B. Pressey, Geo. W. Pitts, A. C. Runyan, J. P. Root, Ralph B. Reitz, Chas. B. Rohland, G. A. Rawlings, H. W. Shriver, M. B. Straight, Jno. W. Storer, Geo. E. Savage, M. C. Smith, Jacob Senty, G. W. Shankland, G. M. Smith, H. S. Seip, W. E. Slatter, Ed. J. Schleif, Henry C. Thompson, D. C. Taylor, A. F. Townsend, E. J. Tucker, Robt. W. Talbot, V. E Turner, Jno. E. Wilkinson, W. E. Wilmott, Geo. H. Wilson, J. J. Wright, P. B. Wright, G. M. Whitfield, E. P. Wright.

SECTION II. Dental Education, Literature, Nomenclature, Histology and Microscopy.

S. H. Guilford, Chairman; M. F. Finley, Secretary; W. C. Barrett, Waldo E. Boardman, D. L. Boozer, Jr., A. J. Brown, J. S. Cassidy, J. A. Chapple, Chas. C. Chittenden, Chas. D. Cook, J. N. Crouse, J. H. Crossland, J. Y. Crawford, Geo. W. Cook, Wms. Donnally, J. F. Dowsley, J. N. Farrar, L. Ashley Faught, Andrew J. Flanagan, F. G. Gregory, C. L. Goddard, Richard Grady, H. T. Harvey, J. A. Libbey, Frank W. Low, E. T. Loeffler, G. S. Martin, Herbert C. Miller, Charles McManus, W. A. Mon-

tell, Garrett Newkirk, Edmund C. Noyes, E. L. Oldfield, Chas. E. Parkhurst, J. P. Root, Howard E. Roberts, Geo. D. Sitherwood, G. L. Simpson, Eugene H. Smith, D. D. Smith, A. F. Sonntag, D. C. Taylor, H. B. Tileston, B. H. Teague, Wm. E. Walker, Geo. H. Wilson, Gordon White, Thos. E. Weeks, J. L. Williams.

SECTION III. Operative Dentistry, Materia Medica and Therapeutics.

D. M. Cattell, Chairman; F. B. Noyes, Secretary; J. F. Adams, T. M. Allen, S. A. Allen, F. LeG. Ames, C. S. Butler, Chas. H. Barnes, E. P. Beadles, H. E. Beach, U. D Billmeyer, J. A. Bishop, Chas. A. Bland, G. V. Black, Arthur D. Black, E. A. Bogue, P. S. Bollinger, W. H. Buckley, H. J. Burkhart, L. T. Canfield, W. G. Chase, W. R. Clack, Wm. Cole, J. W. Combs, J. R. Conway, Wm. Conrad, Martin B. Culver, Dwight M. Clapp, Geo. W. Cook, J. W. David, E. T. Darby, W. P. Dickinson, Wm. Ewald, Ed. Eberle, F. H. Emmerling, A. H. Fuller, H. C. Ferris, Geo. L. Field, S. Freeman, Otto J. Fruth, Alfred C. Fones, Thos. Fillebrown, J. E. Frazier, E. S. Gaylord, Fred W. Gethro, Robert Good, Frank H. Gardiner, N. J. Goodwin, J. N. Giddens, F. D. Gardiner, A. P. Gore, S. L. Goldsmith, H. J. Goslee, E. A. Geilfuss, A. W. Harlan, N. S. Hoff, Geo. E. Hunt, E. P. Hawes, Arthur C. Holbrook, Joseph Huggins, J. I. Hart, Wm. Hosford, H. F. Hoffman, Robt. Huey, G. W. Hoysradt, R. H. Hofheinz, Harvey Iredell, C. N. Johnson, Wm. Jarvie, Daniel A. Jones, V. S. Jones, S. W. Johnson, Chas. O. Kimball, F. B. Keppy, E. N. Kibler, S. E. Knowles, Jas. S. Knapp, Louis C. Leroy, J. D. Loetzerich, Robt. K. Luckie, H. A. Lowrance, J. T. Lippincott, B. F. Luckey, A. E. Lyman, H. B. McFadden, A. F. Merriman, Jr., Melville A. Mason, Thos. Morffew, M. C. Marshall, M. S. Merchant, F. J. Maynard, Chas. A. Meeker, R. A. McDonald, W. T. McLean, Grafton Munroe, Henry W. Morgan, J. Allen Osmun, Alfred Owre, Josephine D. Pfeifer, S. G. Perry, Corydon Palmer, W. E. Page, T. H. Parramore, S. B. Palmer, A. J. Prosser, A. H. Peck, E. G. Quattlebaum, H. C. Raymond, F. A. Remington, A. O. Ross, W. T. Reeves, Jno. F. Stephan, M. B. Straight, C. B. Sawyer, S. C. Searles, H. A. Smith, C. W. Stainton, G. L. Simpson, Chas. S. Stockton, Chas. W. Smith, Wm. W. Shryock, Jacob Senty, C. L. Smith, Jules J. Sarrazin, Jno. A. Schmidt, James Truman, Burton Lee Thorp, H. R. Thill, D. C. Taylor, Henry H. Tompkins, H. B. Tileston, Chas. K. VanVleck, I. N. Van De Water, G. F. Wright, R. A. Wender, E. R. Warner, R. H. Walker, W. C. Wendel, E. K. Wedelstaedt, F. P. Welch, Geo. W. Warren, S. C. G. Watkins.

SECTION IV. Physiology, Etiology, Hygiene, Prophylaxis and Electricity.

J. D. Patterson, Chairman; Emma Eames Chase, Secretary; E. F. Adair, T. M. Allen, H. J. Allen, C. W. Appler, H. L. Ambler, J. H. Benton, L.

M. Cowardin, L. E. Custer, S. J. Cockerille, L. L. Davis, J. B. Dicus, E. J. Eisen, S. Freeman, J. N. Farrar, L. Ashley Faught, Richard Grady, H. T. Harvey, W. Storer How, Henry C. Jones, C. E. Kells, Jr., W. T. Martin, C. N. Peirce, Weston A. Price, D. D. Smith, J. Taft, Geo. S. Vann, A. M. Wright, I. P. Wilson, W. A. White.

SECTION V. Anatomy, Pathology and Surgery.

Thos Fillebrown, Chairman; W. H. G. Logan, Secretary; W. C. Barrett, G. V. Black, Geo. P. Brown, Truman W. Brophy, J. E. Cravens, H. A. Fynn, S. L. Goldsmith, T. T. Hayward, H. C. Harsell, Chas. L. Hungerford, H. T. King, Walter F. Lewis, Jno. S. Marshall, Chas. A. Merrill, W. T. McLean, Fredk. B. Moorehead, Chas. P. Pruyn, R. G. Richter, M. L. Rhein, W. J. Roe, M. C. Smith, Jacob Senty, Burton Lee Thorpe, S. H. Thompson, W. H. Whitslar.

SECTION VI. Clinics.

Robt. H. Nones, Chairman; W. D. Tracy, Secretary; C. L. Alexander, R. S. Bandy, E. K. Blair, L. D. Carpenter, B. J. Cigrand, Wm. Conrad, Martin B. Culver, J. L. Cummins, Southall Dixon, Otto J Fruth, Robert Good, H. J. Goslee, Louis C. Leroy, W. H. G. Logan, S. H. McKee, H. B. Noble, A. J. Prosser, Norman J. Roberts, A. O. Ross, W T. Reeves, Harmon R. Soulan, M. C. Smith, Jacob Senty, D. C. Taylor, S. A. Freeman.

Constitution of the National Dental Association.

ADOPTED AT OLD POINT COMFORT, AUGUST 5, 1897.

PREAMBLE.

We, the members of the American Dental Association and of the Southern Dental Association, do declare ourselves a Society to cultivate the Science of Dentistry, and have adopted the following Constitution and Rules of Order for our government:

CONSTITUTION.

ARTICLE I.

NAME.

This organization shall be known by the name of the National Dental Association.

ARTICLE II.

OBJECT.

The object of this Association shall be to cultivate the science and art of dentistry and all its collateral branches, to elevate and sustain the professional character of dentists, to promote among them a mutual improvement, social intercourse and good feeling, and collectively to represent and have cognizance of the common interests of the dental profession.

ARTICLE III.

MEMBERS TO BE OF THREE CLASSES.

SECTION 1. The members of this Association shall be of three classes, viz., permanent, delegate, and honorary members; the two former classes having equal rights and privileges, except that none but permanent members shall be eligible to office.

PERMANENT MEMBERS.

SECTION 2. Permanent members shall consist of those who, coming as delegates and complying with the requirements of the Association, shall sign a statement in a book to be kept for that purpose, signifying to the Treasurer a desire for permanent membership.

DELEGATE MEMBERS.

SECTION 3. All members shall be practitioners of dentistry. They shall be received only from permanently organized dental societies They shall be elected by ballot at some regular meeting of their society, and shall be members who have done some meritorious work for the profession; but no person shall be received as a delegate who is in arrears for dues to this Association.

SECTION 4. Honorary members shall consist of prominent, worthy members of the dental profession residing in foreign countries, who shall be elected by ballot.

SECTION 5. It is hereby specially provided that all persons at present permanent members of the American Dental Association and of the Southern Dental Association are permanent members of this Association, and entitled to all the privileges of the class to which they belong, without further action, and the Treasurer is hereby directed to transcribe their names upon the roll of membership of this Association.

ARTICLE IV.

DELEGATES FROM STATE SOCIETIES.

SECTION 1. Any permanently organized dental society may send one for every six of its active members, as delegates to this Association for one year, upon complying with the requirements of its Constitution; but no society shall be entitled to representation that does not accept or substantially recognize the Code of Ethics of this Association.

SECTION 2. Each delegate shall present credentials which shall be approved by the Executive Committee.

SECTION 3. If the Committee on Credentials has knowledge that any applicants for membership are violating the Code of Ethics, said applicants shall not be received, but shall be referred by the committee to the societies whose delegates they are, and in no case shall this Association be compelled to treat with violations of the Code except the violator is a member of this body and has no membership in any local body.

SECTION 4. This Association will receive no delegates who, since August, 1875, shall have entered the profession without having first graduated at some reputable dental or medical college.

ARTICLE V.

SIGNING CONSTITUTION.

SECTION 1. Each new member, before voting or speaking on any subject before the meeting, shall sign this Constitution, inscribing his name and the title of the society from which he receives his appointment.

DUES.

SECTION 2. The annual dues in this Association shall be five dollars.

DUES—TO BE PAID.

SECTION 3. No member is eligible to office, nor can he speak or vote in this Association, or in any of its branches, until his annual dues are paid.

DUES—IF UNPAID.

SECTION 4. If the dues of any member remain unpaid for two years his name shall be erased from the list of members of this Association.

CONDUCT OF MEMBERS.

SECTION 5. Any act of special immorality or unprofessional conduct committed by a member of this Association shall be referred to the Executive Committee, whose duty it shall be to thoroughly examine into the case, and if the charges be sustained, to report to the Executive Council at the next meeting of the annual session at which the charges are preferred. Whereupon, by a vote of the council the offending member may be reprimanded or expelled, a two-thirds vote being required for expulsion, a majority being sufficient for reprimand.

EXPELLED MEMBERS.

SECTION 6. Any member of this Association being expelled or suspended from his local society, shall from that date cease to be a member of this body.

RESIGNATION OF MEMBERS.

SECTION 7. Any member not in arrears may offer his resignation, upon the acceptance of which by the council, his membership shall cease; but the Council may at any time thereafter reinstate such member by unanimous consent.

ARTICLE VI.

OFFICERS.

SECTION 1. The officers of this Association shall be a President, three Vice-Presidents, Corresponding Secretary, Recording Secretary, Treasurer, and an Executive Committee consisting of nine members.

EXECUTIVE COUNCIL.

SEC. 2. The President, Secretary, and five members to be elected annually by the Association shall constitute an Executive Council, and shall be governed by the same rules of order as the Association.

TERM OF OFFICE

SEC. 3. Each officer, except as otherwise provided, shall hold his appointment for one year, or until another is elected and qualified to succeed him.

ELECTION OF OFFICERS.

SEC 4. The President, Vice-Presidents, Corresponding Secretary, Recording Secretary, Treasurer, and members of the Executive Council and Executive Committee shall be elected by ballot in open session of the Association.

Three members of the Executive Committee shall be chosen from each division.

SEC. 5. Commencing with 1898 the President shall be chosen from the division in which the meeting is to be held.

SEC. 6. One of the Vice-Presidents shall be chosen from each division,—namely, one from the East, one from the West, and one from the South.

SEC. 7. The candidates for President and Vice-Presidents shall be nominated by an informal ballot of the Association. The three names, or in case of a tie, the four names, having the greatest number of votes, shall be the sole nominees.

A formal ballot shall then be taken, in which a majority of the ballots cast shall be necessary to a choice.

The informal ballot may be made formal by a three-fourths vote of the members present.

ARTICLE VII—DUTIES OF OFFICERS.

DUTIES OF PRESIDENT.

SECTION 1. The President shall preside according to parliamentary usage as laid down in "Robert's Rules of Order" and the Rules of Order adopted by this Association, and shall present an annual address.

DUTIES OF VICE-PRESIDENTS.

SEC. 2. In the absence of the President, one of the Vice-Presidents shall perform the duties of the office, and in the absence of these officers a Chairman pro tem shall be appointed by the Executive Council

DUTIES OF CORRESPONDING SECRETARY.

SEC. 3. The Corresponding Secretary shall attend to the correspondence of the Association with the societies therein represented, and with other scientific bodies as may be desirable, and shall report to the Executive Council.

DUTIES OF RECORDING SECRETARY.

SEC. 4. The Recording Secretary shall keep accurate minutes of the proceedings of the Association, preserve the archives and unpublished documents, and attend to the other duties that pertain to his office. He shall be *ex-officio* chairman of the Publication Committee, and shall see that due notice is given of the time and place of the sessions of the Association.

DUTIES OF TREASURER.

SECTION 5. The Treasurer shall hold all the moneys belonging to the Association, and shall keep an accurate account as between the Association and its members. He shall furnish bonds satisfactory to the Executive Committee. He shall attend the session of the Executive Committee at 8 a. m. on the day of the annual meeting to receive dues, and shall attend at roll-call to verify the list of names, checking all such as are in arrears for dues; he

shall restore such names upon payment of dues within the legal limits, and shall notify all whose names may be erased from the list of membership. He shall pay the drafts of the Secretary, countersigned by the President, and shall report to the Executive Committee, where his accounts shall be audited and by whom his report shall be presented to the Executive Council, together with their own.

SEC. 6. All resolutions appropriating money, except for the legitimate expenses of this Association, shall require a two-thirds vote of all the members of the Association present at a regular meeting.

EXECUTIVE COUNCIL.

SEC. 7. The Executive Council shall meet at 10 o'clock on the day of the first meeting of each annual session, and afterward by adjournment, or at the call of the presiding officers for the reception of the reports of officers and committees, and for the transaction of other business of the Association.

SEC. 8. All matters not otherwise specially provided for shall be referred to the Executive Council without debate.

SEC. 9. The Executive Council shall report to the Association at each session the results of their proceedings for ratification or rejection without debate.

SEC. 10. The President and Secretary of the Association shall hold the same position in the Executive Council as in the Association.

SEC. 11. Four members of the Council shall constitute a quorum for the transaction of business.

SEC. 12. All meetings of the Council shall be public, the time and the place for which shall be posted for information of the members. Members may be heard on any matter before the Council.

ARTICLE VIII.

EXECUTIVE COMMITTEE.

SECTION 1. The Executive Committee shall be the business committee of the Association. They shall report to the Executive Council at each session, under the proper head, their doings for the current year.

CLASSIFICATION OF EXECUTIVE COMMITTEE.

SEC. 2. At the first election of the Executive Committee, the first three shall be elected to serve three years, the second three for two years, and the last three for one year, and thenceforward one new member shall be elected each year by separate ballot, from each division, to serve three years, and in case of the absence of any member of this committee his place may be temporarily filled by the remaining members of the committees.

SUBDIVISION OF EXECUTIVE COMMITTEE.

SEC. 3. The Executive Committee shall meet after the election of new members to choose their own chairman and secretary, and to divide themselves into three sub-committees as follows, and for the purposes described:

FIRST DIVISION—COMMITTEE OF ARRANGEMENTS.

SEC. 4. The first division of this committee shall act as the Committee of Arrangements, and shall make suitable preparations for the meetings of the Association, of which they shall have the charge. They shall provide a book for the registration of members or visitors as they arrive, with the place of their residence and hotel address, and shall attend to the general wants of the Association during its session. It shall be their further duty to secure from the Treasurer a good and sufficient bond.

SECOND DIVISION—CREDENTIALS AND AUDITING COMMITTEE.

SEC. 5. The second division shall examine and verify the credentials and qualifications of members, including all violations of the Code of Ethics and the Constitution, and shall also be the Auditing Committee for that year.

THIRD DIVISION—COMMITTEE ON VOLUNTEER ESSAYS.

SEC. 6. The third division shall examine all volunteer essays before they are read to the Association, and such as they approve they shall refer to the proper Section.

They shall report names of places for the next session of the Association.

REPORTS OF SUB-COMMITTEES.

SEC. 7. Each of these sub-committees shall report from time to time, as may be necessary, to the Executive Committee as a whole, who shall decide upon such report, if possible; but in case of their inability to decide upon any matter, it shall be brought before the Executive Council for its decision.

MEETINGS OF EXECUTIVE COMMITTEE.

SEC. 8. The Executive Committee shall, if possible, meet for consultation and arrangement of their respective duties on the day preceding the annual session of the Association, and shall meet for the examination of credentials and the reception of papers, and such other business as may properly come before them, at 8 A. M. on the first day of the annual session.

CHAIRMAN MAY CONVENE THE COMMITTEE.

SEC. 9. The Chairman of the Executive Committee may at his own discretion summon the members thereof to a meeting at any suitable hour during the sessions of the Association, and at any other time at the request of five members of the committee.

ARTICLE IX.

LOCAL COMMITTEE OF ARRANGEMENTS.

SECTION 1. There shall be appointed by the President, annually, a committee of three, residing at or near the place selected for the next meeting, whose duty it shall be to assist the Executive Committee to procure rooms for meetings, and make such other local arrangements as may be needed for the Association.

PUBLICATION COMMITTEE—HOW APPOINTED.

SEC. 2. The President shall appoint two members of this Association who shall act in conjunction with the Recording Secretary as the Publication Committee. The Committee shall be authorized to employ a competent reporter to furnish an accurate report of the proceedings of each meeting.

INSTRUCTIONS TO THE PUBLICATION COMMITTEE.

SEC. 3. The Publication Committee shall superintend the publication and distribution of such portions of the transactions as the Executive Council may direct, or the committee judge to be of sufficient value. They shall specify in the annual report of this committee the character and cost of the publications of the Association during the year, and the number of copies still on hand.

SEC. 4. Any report or other paper, to be entitled to publication in the volume of the Transactions for the year in which it shall be presented to the Association, must be placed in the hands of the Publication Committee within twenty days after the close of the annual session, and must also be so prepared that the proof sheets furnished the authors shall be returned to the committee without material alteration or addition.

SEC. 5. Every paper received by this Association, and all plates or other means of illustration, shall be considered the exclusive property of the Association, and shall be published for its benefit.

DISCLAIMER.

SECTION 6. The Publication Committee is hereby instructed to print at the beginning of each volume of the transactions the following disclaimer, viz.: "The National Dental Association although formally accepting and publishing the reports of the various sections, and the essays read before the Association, holds itself wholly irresponsible for the opinions, theories or criticisms therein contained, except when otherwise decided by special resolution."

ARTICLE X.

QUORUM.

Fifteen members shall constitute a quorum in this Association.

ARTICLE XI.

SUSPENSION OF RULES—THREE-FOURTHS TO VOTE.

The regular order of business may be temporarily suspended by a three-fourths vote of all the members present, for the consideration of a specific subject, upon the completion of which the regular order shall be at once resumed.

ARTICLE XII.

TIME AND PLACE OF MEETINGS.

SECTION 1. The regular sessions of this Association shall commence annually at 11 A. M. on the first Tuesday after the last Saturday in August, or

at such time as shall be determined by vote of the Association at the annual session.

SEC. 2. The place for holding the next annual session shall be determined each year by ballot of the Association at its annual session, except that the place of meeting shall be in the West in 1898, in the East in 1899, and in the South in 1900, and thereafter, in the order named, meeting in each section every third year.

SEC. 3. For the purposes of this Association, the United States shall be divided into three divisions, to be called The East, The South, and The West.

The East shall include New England, New York, New Jersey, Pennsylvania, Ohio, Indiana, lower peninsula of Michigan and Ontario.

The South shall include Delaware, Maryland, District of Columbia, Virginia, North Carolina, South Carolina, West Virginia, Georgia, Florida, Alabama, Mississippi, Louisiana, Texas, Kentucky, Tennessee, Arkansas, Oklahoma and Indian Territory.

The West shall include Illinois, Missouri, Wisconsin, upper peninsula of Michigan, Minnesota, Iowa, North Dakota, South Dakota, Nebraska, Kansas, Montana, Wyoming, Colorado, Idaho, Utah, Washington, Oregon, Nevada, California, Arizona, New Mexico and Alaska.

ARTICLE XIII.

ORGANIZATION OF SECTIONS.

SECTION 1. This Association shall be divided into six Sections, as follows:

1. Prosthetic Dentistry, including Crown- and Bridge-Work, Metallurgy, Chemistry, Orthodontia.
2. Dental Education, Literature, Nomenclature, Histology, Microscopy.
3. Operative Dentistry, Materia Medica, and Therapeutics.
4. Physiology, Etiology, Hygiene, Prophylaxis and Electricity.
5. Anatomy, Pathology, and Surgery.
6. Clinics.

SECTION 2. It shall be the duty of each member to identify himself with one or more of the above-named sections, and he shall inform the Recording Secretary of his choice at the time of joining the Association.

SEC. 3. The Secretary shall assign members to the Sections in which they are expected to work if they shall fail to make their own choice before the close of the morning meeting of the second day of the session.

SEC. 4. It shall be the duty of the Recording Secretary, immediately at the close of the morning meeting of the second day, to present lists of the names of each Section, as a basis for the organization of the Sections.

SEC. 5. The members of each Section shall choose a Chairman and Secretary, and they shall be members known to be capable, and interested in the performance of the duties of the offices.

SEC. 6. The Chairman of each Section shall preside at all of its meetings;

shall exercise general supervision over the business, and shall see that the labors of his Section are conducted in the manner calculated to secure the best results. The Chairman, and such other member or members as the Section shall select, shall prepare and read at the annual session of the Association next ensuing, a paper or papers on the advances and discoveries of the past year in the branches included in the Section. The reading of such papers shall not together occupy more than forty minutes.

SEC. 7. The several Sections shall meet at 9:30 A. M. on the morning of the first day of the annual session of the Association.

SEC. 8. For the information of all members, a list of the members of each Section shall be published in the Transactions of each year.

SEC. 9. The reports of the Sections shall be called by the President in consecutive order, beginning each succeeding year one number higher than on the preceding year, and no Section having been called and passed shall be again heard until all others have been called.

ARTICLE XIV.

BRANCHES.

SECTION 1. For the wider diffusion of the benefits of this Association, the members of each division may form themselves into one or more separate bodies, to be styled "Branches."

POWERS AND OBLIGATIONS.

SECTION 2. Branches shall have such powers and privileges, and be subjected to such obligations, as shall be determined upon from time to time by the National Association in annual session.

GOVERNMENT.

SECTION 3. Each Branch shall be free to hold meetings and to govern itself as its members shall think fit, but no Branch law shall be valid which, in the opinion of the National Association, may contravene any fundamental law of the Association.

EXPENSES.

SECTION 4. Each Branch shall pay its own expenses, and no Branch shall be deemed for any purpose the agent of the Association, or have power to incur any obligation in its behalf.

PROCEEDINGS.

SECTION 5. Each Branch shall furnish a copy of its proceedings, including papers and discussions, for publication with the transactions of the National Association.

DELEGATES.

SECTION 6. Each Branch may receive delegates from societies within its division upon the same conditions as the National Association, and such delegates shall have the same standing in the National Association as though admitted directly from the state societies.

DUES.

SECTION 7. The annual dues of members attending the Branches shall be paid to the Branch Treasurer. Three-fifths of the dues may be retained for the benefit of the Branch. The remaining two-fifths shall be paid over to the Treasurer of the National Association.

SECTION 8. The annual session of any Branch shall be omitted whenever the annual session of the National Association shall be held in its division.

RULES OF ORDER.

1. On the arrival of the hour of meeting the President shall take the chair, call to order, and announce that the meeting is open for business.

2. No motion or speech shall be in order until the mover or speaker shall have been recognized and assigned the floor by the chair, nor shall a motion be open for debate until seconded and stated by the chair.

3. No one shall be permitted to address the Association before giving his name and residence, which shall be distinctly announced from the chair; nor shall he speak more than twice, nor longer than fifteen minutes in all, unless by consent of the Association.

4. At the request of any member a motion shall be put in writing.

5. At the request of five members a question shall be divided, or the yeas and nays ordered.

6. When a question is under debate no other motion shall be in order, except—1st, to adjourn; 2d, to lay on the table; 3d, the previous question; 4th, to postpone; 5th, to commit; 6th, to amend —and these motions shall take precedence in the order here stated.

7. The previous question, and the motions to adjourn, to lay on the table, and to postpone, shall be decided without debate.

8. A motion to adjourn shall always be in order, but no member can make such a motion while another is speaking or while a vote or ballot is being taken.

9. A second amendment to the main question shall not be in order until the first is disposed of, nor shall there be an amendment of an amendment to an amendment.

10. After a motion has been seconded and stated by the chair, it shall not be withdrawn without the consent of the Association.

11. No member shall interrupt another while speaking, except to raise a point of order.

12. When called to order, a member shall sit down until the point of order is decided by the chair, or, in case of appeal, by the Association. If the point of order be sustained, the member can proceed in order by the consent of the Association.

13. Every member shall vote upon a question unless excused by the Association.

14. When any motion, except to adjourn, has been rejected, it shall not be renewed without unanimous consent.

15. Any member who on a question voted in the majority may move a reconsideration of that question; but if that motion shall be lost or laid upon the table, it shall not be renewed without unanimous consent.

16. The President may vote with the members upon all questions, but having so voted, shall not give the casting vote in case of a tie.

17. Motions for filling blanks shall be put in the order in which they are moved.

18. On a division, or in voting by yeas and nays, any member may change his vote before the result is declared.

19. These rules may be suspended by unanimous consent.

ORDER OF BUSINESS.

8 A. M.—Meeting of Executive Committee for filling of vacancies.
9 A. M.—Meeting of Executive Council.
9:30 A. M.—Meeting of Sections.
11 A. M.—Meeting of the Association.
President's Address.
Report of Sections and discussions.
Report of Executive Council.
Ballot for place of next annual session.
Election of Officers.
Installation of Officers.
Appointment of Committees.
Reading of minutes.
Adjournment.

AMENDMENTS.

The Constitution, Rules of Order, and Order of Business of this Association may be altered or amended at any annual session by unanimous consent of the members present, providing notice has been given in writing at a previous meeting of the annual session at which the amendment is proposed; or by a vote of two-thirds of the members present, providing notice of the alteration or amendment has been given in writing at a previous annual session.

STANDING RESOLUTIONS.

The following standing resolutions are in force at this time:

1. *Resolved,* That a paper presented to the Committee on Voluntary Essays, and by them considered and returned to the writer with notification

that the said paper is not accepted, cannot afterward be read before the Association unless it is made the special order by resolution adopted.

2. *Resolved*, That this Association discountenances the giving of banquets, excursions, entertainments, etc., by local professional societies or individuals, either during or at the close of our annual meetings.

3. *Resolved*, That it is unprofessional to use on cards or signs anything except name, title, and address.

4. *Resolved*, That this Association now in session direct that Sections belonging thereto shall in the future be prohibited from inviting individuals who are violating the Code of Ethics to hold clinics or to give other exhibitions before this body.

5. *Resolved*, That a Standing Committee of three be appointed, to be known as the Committee on Termology, whose duty it shall be to prepare and submit a carefully prepared report at each annual meeting of this Association.

6. *Resolved*, That this Association believes the conferring of honorary degrees in dentistry to be detrimental to the profession of dentistry, and hereby expresses its disapprobation of the practice.

7. *Resolved*, That a committee of three be appointed by the chair to cooperate with the officers in charge of the Army Medical Museum and Library in enriching its store of dental literature and specimens, especially by appealing to dental societies and individual members of the dental profession for assistance.

8. *Resolved*, That the National Dental Association condemns the use of secret preparations known as "*local anesthetics*," as well as all other secret preparations.

9. *Resolved*, That the secretary or other officer of each society sending delegates to this Association is expected to make a general report of the work done by the society he represents during the year, giving the subjects of the papers read before them and digests of the same, and to send said reports to the Secretary of this Association at least three weeks before the date of each annual meeting; the reports to be forwarded to the Chairman of the Section to which they belong.

10. *Resolved*, That any member of the dental profession who has been in reputable practice for a period of fifty years may be elected to permanent membership in the Association without payment of dues, and any member of this Association who has been in practice for a like period shall have his dues remitted thereafter by presenting the fact to the Treasurer of the Association.

11. *Resolved*, That lists of the ex-presidents of the American Dental Association and of the Southern Dental Association shall be published annually in the Transactions of the National Dental Association, and that all members and officers hold the same relations to the National Dental Association that they did to the former associations.

CODE OF ETHICS.

Article I.—THE DUTIES OF THE PROFESSION TO THEIR PATIENTS.

Section 1. The dentist should be ever ready to respond to the wants of his patrons, and should fully recognize the obligations involved in the discharge of his duties toward them. As they are in most cases unable to correctly estimate the character of his operations, his own sense of right must guarantee faithfulness in their performance. His manner should be firm, yet kind and sympathizing, so as to gain the respect and confidence of his patients; and even the simplest case committed to his care should receive that attention which is due to operations performed on living, sensitive tissue.

Sec. 2. It is not to be expected that the patient will possess a very extended or a very accurate knowledge of professional matters. The dentist should make due allowance for this, patiently explaining many things which may seem quite clear to himself, thus endeavoring to educate the public mind so that it will properly appreciate the beneficent efforts of our profession. He should encourage no false hopes by promising success when, in the nature of the case, there is uncertainty.

Sec. 3. The dentist should be temperate in all things, keeping both mind and body in the best possible health, that his patients may have the benefit of that clearness of judgment and skill which is their right.

Article II.—MAINTAINING PROFESSIONAL CHARACTER.

Section 1. A member of the dental profession is bound to maintain its honor, and to labor earnestly to extend its sphere of usefulness. He should avoid everything in language and conduct calculated to dishonor his profession, and should ever manifest a due respect for his brethren. The young should show special respect to their seniors; the aged, special encouragement to their juniors.

Sec. 2. It is unprofessional to resort to public advertisements, cards, handbills, posters, or signs, calling attention to peculiar styles of work, lowness of prices, special modes of operating; or to claim superiority over neighboring practitioners; to publish reports of cases or certificates in the public prints; to circulate or recommend nostrums; or to perform any other similar acts. But nothing in this section shall be so construed as to imply that it is unprofessional for dentists to announce in the public prints, or by cards, simply their names, occupation, and place of business, or, in the same manner, to announce their removal, absence from, or return to business, or to issue to their patients appointment cards having a fee bill for professional services thereon.

Sec. 3. When consulted by the patient of another practitioner, the dentist should guard against inquiries or hints disparaging to the family dentist, or calculated to weaken the patient's confidence in him; and if the interests

of the patient will not be endangered thereby, the case should be temporarily treated, and referred back to the family dentist.

Sec. 4. When general rules shall have been adopted by members of the profession practicing in the same localities in relation to fees, it is unprofessional and dishonorable to depart from those rules, except when variation of circumstance requires it. And it is ever to be regarded as unprofessional to warrant operations as an inducement to patronage.

Article III.—CONSULTATIONS.

Consultations should be promoted in difficult or protracted cases, as they give rise to confidence, energy, and broader views in practice.

In consultations that courtesy and just dealing which is the right of all should be especially observed.

Article IV.—THE RELATIVE DUTIES OF DENTISTS AND PHYSICIANS.

Dental surgery is a specialty in medical science. Physicians and dentists should both bear this in mind. The dentist is professionally limited to diseases of the dental organs and adjacent parts. With these he should be more familiar than the general practitioner is expected to be; and while he recognizes the broader knowledge of the physician in regard to diseases of the general system, the latter is under equal obligations to respect his higher attainments in his specialty.

Article V.—THE MUTUAL DUTIES OF THE PROFESSION AND THE PUBLIC.

Dentists are frequent witnesses, and, at the same time, the best judges of the impositions perpetrated by quacks, and it is their duty to enlighten and warn the public in regard to them. For this and many other benefits conferred by the competent and honorable dentist, the profession is entitled to the confidence and respect of the public, who should always discriminate in favor of the true man of science and integrity against the empiric and impostor. The public has no right to tax the time and talents of the profession in examinations, prescriptions, or in any way without proper remuneration.

PRESENTED TO THE COLLEGE OF
DENTAL AND ORAL SURGERY OF
NEW YORK BY THE DEAN
WILLIAM CARR, M.D. D.D.S.

PROPERTY OF
College of Dental and Oral Surgery of New York

Members of the National Dental Association.

Abendschein, H. S. ..... 1644 E. Baltimore st., Baltimore, Md.
*Alexander, C. L. ..... 7 N. Tryon st., Charlotte, N. C.
Allen, Jerome H., ... 421 H. st., N. E., Washington, D. C.
Allen, E. H., ... German Ins. Bldg., Freeport, Ill.
Allis, D. Hurlbut ..... Masonic Temple, Springfield, Mass.
*Ambler, H. L., ... 176 Euclid ave., Cleveland, O.
Ames, W. V-B ..... Venetian Bldg., Chicago, Ill.
*Brophy, Truman W. ..... 1405 Champlain Bldg., Chicago, Ill.
Babcock, C. L. ..... 50 Colby & Abbott Bldg., Milwaukee.
Bandy, R. S. ..... City Hall Bldg., Tipton, Ia.
Barrett, W. C. ..... 208 Franklin st., Buffalo, N. Y.
*Beach, H. E. ..... Clarksville, Tenn.
*Beach, Jno. R. ..... Clarksville, Tenn.
Begun, A. R. ..... 522 Walnut st., Des Moines, Ia.
Belding, Geo. H. ..... Calmar, Ia.
Bethel, L. P. ..... Kent, Ohio.
*Benton, J. H. ..... Box 445, Newberne, S. C.
*Boozer, D. L. ..... Newberry, S. C.
Boozer, J. E. ..... 1515 Main st., Columbia, S. C.
Billmeyer, U. D. ..... Miller Bldg., Chattanooga, Tenn.
Black, G. V. ..... Madison & Franklin sts., Chicago, Ill.
Black, Arthur D. ..... 31 Washington st., Chicago, Ill.
Blair, E. K. ..... Waverly, Ill.
Bogue, E. A. ..... 63 W. 48th st., New York City.
*Bollinger, P. L. ..... 5th and Ludlow sts., Dayton, Ohio.
*Bogle, R. Boyd, ... Church st., Nashville, Tenn.
*Brabson, B. D. ..... Knoxville, Tenn.
Boardman, Waldo E. ..... 184 Boylston st., Boston, Mass.
*Brockett, C. T. ..... 301-2 The Grand, Atlanta, Ga.
*Brown, A. J. ..... 1345 L st., Washington, D. C.
Burkhart, H. J. ..... Batavia, N. Y.
Burkhart, W. E. ..... 930 Pacific ave., Tacoma, Wash.
Butler, C. S. ..... 680 Main st., Buffalo, N. Y.
Campbell, S. A. ..... Central Bldg., Mattoon, Ill.

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*Those marked thus (*) were not present, but sent their dues. Those marked thus (*d*) were delegates, but not permanent members.

*Cannaday, J. W. ..... 283 State St., Albany, N. Y.
Carson, W. H. ..... 609 Goldsmith Bldg., Milwaukee, Wis.
Case, C. S. ..... 92 State St., Chicago, Ill.
*Cassidy, J. S. ..... 732 Madison ave., Covington, Ky.
Cattell, David M. ..... 100 State st., Chicago, Ill.
*Chace, J. E. ..... Ocala, Fla.
*Chambers, W. T. ..... California Bldg., Denver, Colo.
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Kentucky	4
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North Dakota	1
Rhode Island	1
Canada	1
Total	355

NATIONAL DENTAL ASSOCIATION

SOUTHERN BRANCH.

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ANNUAL ADDRESS.

By T. P. HINMAN, President.

THIS annual gathering of the southern dentists brings together all that is good in our great southland. The brotherly feeling here engendered lasts as long as life itself, and when one of our brothers in arms passes away we feel as though we had sustained a personal loss.

This Association represents the arena of professional life where the young dentist tries his steel against his elders and finds that there is something new under the sun, if not under the sun, new to him. The young men should be more encouraged to attend these conventions, for some of the greatest achievements in American dentistry have had their inception in the Southern Dental Association, of which we are a perpetuation.

As there was some controversy in reference to holding a meeting of the "Southern Branch" at Old Point Comfort last year, your president feels it incumbent upon him to make a statement of the facts in the case, as he feels his position has been misrepresented. The constitution explicitly states that the annual meeting of any branch shall be omitted whenever the annual session of the "National Body" shall be held in its division. Therefore your president did not deem it constitutional to have delegates elected to a branch that had no annual meeting, but at the request of several members of the Southern Branch a meeting was called during the annual session of the National at Old Point Comfort and delegates from state societies were received. This action should be ratified or condemned at this meeting so as to settle the point as to whether the Southern Branch can receive delegates when it has no annual session.

At this called meeting the Association voted to meet at Lookout Mountain, and everyone knows that the hotels there are open only in summer, so the concensus of opinion seemed to be that we should turn to summer meetings, and it was so understood by the president and executive committee. Your president immediately corres-

ponded with the lessees of the hotels at Lookout and found that only prohibitive rates could be obtained. Lookout was then abandoned as impracticable. The names of the following cities were then proposed as places of meeting: Atlanta, Nashville and Asheville. These names were sent by the chairman of the executive committee to each of its members and by ballot Nashville was selected, and the time chosen for meeting was July 30, 1901. It was found that the Faculties' Association met at Milwaukee on the following Thursday, therefore the time was changed to July 29, the Faculties agreeing to hold their meeting one day later so that the members of the Southern Branch who are members would have time to finish their work in Nashville and go to Milwaukee in time for business there.

Arrangements were made with the Southeastern Passenger Association, so that members desiring to go from Nashville to Milwaukee could deposit their certificates with the agent in Nashville, and take them up on their return. This greatly reduced the expense of those wishing to attend the National, and it did not add in any way to that of those returning to their homes from Nashville.

Some adverse and unkind criticism has been made by a member of the Association as to the conduct of the Association's work by your president. He desires to say only that what he has done has been from the best motives and for the best interests of the Southern Branch. The position of your president, in being the first one to hold over two years since the organization of the Southern Branch, has proved a very trying one, in that his forces were so scattered and disorganized that it was hard to get a working force together. However, he visited three state associations and had delegates elected therefrom, and sent notices to other state societies of that privilege. Some more perfect method should be adopted for the notification of the state dental societies of this privilege.

Duties of the Corresponding Secretary—The president suggests that the constitution be changed so that it shall be the duty of the corresponding secretary each year to notify the corresponding secretaries of the different state associations of their privilege of electing delegates to this association. We know of members in good standing in their state associations who have come to their associations without the proper credentials on account of ignorance of the fact that they must be elected at a regular meeting of their state society.

Time of Meeting—I am aware that there has been some dissatis-

faction as to the time of holding our meeting, some of the members preferring winter meetings. I think the association should come to some definite understanding as to whether we should hold our meetings in summer or winter. The greatest objection to the winter meeting is that a large part of our membership is composed of college men and it is very difficult for them to leave their work during college session. A seeming remedy for this would be to hold the meeting in a week containing some public holiday, such as the 22d of February, but this only partially obviates the difficulty. The great advantage of holding the meeting in summer comes from the fact that it is generally considered the dullest part of the year. This is the first summer meeting we have ever held since becoming a branch of the National, and to a certain degree it ought to be a criterion.

Committees—According to our constitution and by-laws we have fourteen different committees, which makes our organization unwieldy. They could just as easily be cut down to eight or ten, which would save some time and make our meetings more easily handled. It is hard for an executive officer to appoint so many good active chairmen and he is often seriously handicapped by the passive acceptance of the chairmanship of a committee by one who never does the work which devolves upon him. What we need is a more lively interest in our work.

I believe that the Southern Branch is at a critical period of existence, and we must either devote ourselves more fully to its upbuilding or abandon it entirely, as it can never exist and be a success in the present lukewarm condition of so many of its members. What we can do to enliven interest and make our meetings more attractive to the rank and file of the profession is to get a full clinic list, and meet in large central cities, where railroad facilities and hotel accommodations of all description are readily found. I find that most of our committees have been very much hampered because of the failure of the members to answer communications addressed to them. This should not be so, as every member of the association should be in duty bound to acknowledge such communications.

Nostrums—The country is being flooded with nostrums of every description for the purpose of mummifying the nerves of teeth, filling root-canals, painless extractions, and dentrifices for the cure of pyorrhea alveolaris, etc. It is to be regretted that our reputable

dental journals are receiving these ridiculous advertisements and I feel that their actions ought to be condemned. No reputable practitioner would use anything of which he knows not the ingredients. Suppose, for instance, he inserts into the gum tissue some of the many local anesthetic nostrums that are foisted upon the profession. If he knows not the drugs entering into the combination how can he give an antidote for any constitutional symptoms that may follow? All of these things tend towards quackery and I feel should receive the hearty condemnation of this association.

Scientific Branch—In this day and time of scientific research I feel it incumbent upon us to offer some inducement to our young men to follow out original work, and I believe it would be a good idea to establish a medal to be given at each annual meeting for the best essay on original investigation, the subject to be chosen by the writer. I also believe it would be a good idea to establish an office in this association known as the "Essayist"—the man to be elected at the annual meeting of this association and serve for the term of one year or until his successor is elected. His duties should be to prepare an essay to be read before the association at its annual meeting (following his election), the subject to be chosen by the writer. I believe this would be an attractive feature of our meeting.

Clinics—In reference to clinics, I think we should choose some special line of work in addition to the general demonstration, such would undoubtedly have a tendency to settle some of the mooted questions of practice. This special subject for clinical work should be decided by the clinic committee and published at the annual meeting previous to the one at which it is to be used. In addition to this, every clinician should be required to make a written report to the chairman of clinics, so that those who cannot see will not lose the benefit of the clinician's ideas. One trouble we have with clinicians is that we have so many who promise, and have their names put down on the program, and then fail to put in an appearance; and if they do come they are totally unprepared, in the way of instruments, etc., to do the operations to which they have consented. Just how to remedy this serious defect in our clinicians is too great a problem for your president to decide, but it is hoped that some plan may be evolved that will suggest a remedy in this our most important department.

Annual Dues—The annual dues to this association are five dol-

lars, three dollars of which are paid to the treasurer of the National Dental Association, only two dollars remaining in our treasury. I do not believe that we can be a success with this state of affairs existing and should we not petition the N. D. A. to let us retain three-fifths and give them the two-fifths? When the association came into my hands we were in a state of bankruptcy.

Consultations—I very much fear that the value of consultation is underestimated by a majority of our profession. There was a time when every man had unto himself certain practices and methods that he thought made him superior to his confreres, and no one but himself and his patient were allowed in the room during the operations, and all the work was surrounded with an air of mystery as though by some magic hand and wonderful knowledge success was attained. The visiting dentist was met at the door with a cool but polite bow, and was made to understand that his visit terminated in the reception-room. Modern dentistry has tended to lay aside these expressions of ignorance and conceit and we are now working upon a broader plane made possible by our associations. The modern dentist should be ready to explain to his intelligent patient the cause and effect of each trouble, etc. The wise enquire the way, but the fool goes on and is punished. In our mother profession, medicine, no difficult operations are attempted without previous consultation, and I believe many a life has been saved by such procedure, and can we not say truly that the expressions of many a face and mouth could be beautified instead of marred if we would consult more with our fellow practitioners.

Dentistry in the Army—Since our last meeting the army reorganization bill has been passed, which provides for a corps of thirty dentists in the army, a number quite inadequate for the work, but still we feel that we have an entering wedge. To Dr. Wms. Donnally of Washington was due to a great extent the credit of lobbying the bill through Congress; and it was supposed he would be appointed one of the members of the examining board, but the officials thought differently, holding that no person should be benefitted by legislation that he had been instrumental in having passed. I think some fitting tribute from this association should be sent to Dr. Donnally in recognition of his services. I cannot refrain, in passing this subject, to relate that our revered friend, the late Dr. H. J. McKellops, was the first one that suggested that dentists

should be appointed in the army. Now, as we have dentists in the army, I do not think we should stop in our efforts to have them appointed in the navy, as they are certainly needed there more than in the army.

Obituary—The last two years have brought sadness to our association, for the much loved faces of several of our devoted members are seen no more. The Grim Reaper has cut the slender cord that bound them here on earth and they have gone to their reward. Four of our charter members have passed away, Dr. Morgan of this city, Dr. H. J. McKellops of St. Louis, Dr. W. T. Arrington and Dr. W. W. H. Thackston. They were all ex-presidents of this association, and another ex-president has passed over to the other side—Dr. B. H. Catching of Atlanta. Although passed from this life and its scenes of toil and disappointments, sometimes pleasure, the impress of their lives upon this association will be felt for all time to come. Another one of our dear friends has fallen by the wayside. Growing weary of this toil and strife, he laid aside the mantle of mortality and shroud of dust and ashes, and has taken the spirit of the immortal and gone to his rest above. It is our friend, Col. J. W. Selby, manager of the S. S. White Company in Atlanta. His efforts were always untiring and unceasing toward the upbuilding and improvement of this association as well as our profession in the south. I think that some fitting tribute should be made by this association to their memories and sent to their respective families.

In conclusion, your president wishes you a most successful and profitable meeting.

Gold Filling—A Retrospect.

PAPER BY H. H. JOHNSON, D.D.S., MACON, GA.

Since the days when dentistry had a beginning the various preparations of gold have been accorded a place as the most important of materials for filling cavities of decay in human teeth. It is interesting to note the many changes it has undergone during all these years in methods of manufacture and manipulation, each change being made in an attempt to lessen the tediousness of its working qualities and to increase its effectiveness as a tooth preserver. That gold has been able to retain its place in the estimation of operators of all periods as the first and best of filling materials, no matter what form or method be employed, is evidence that it is thus far entitled to the name of king of filling materials as well as king of metals.

Previous to about 1850 gold was employed for "plugging," as it was then termed, in the form of soft or noncohesive foil. It was very desirable that the foil should have no "adhesive or sticky" qualities, but should work perfectly soft and pliable. Hand pressure was the force employed for condensing the "plug," and the wedging principle was used for retaining it in place. Mallet force was not used until some time about 1864. In the *Cosmos*, 1865, in an article by Dr. I. J. Wetherbee, read before the Massachusetts Dental Association, condemning the use of the mallet, he uses these words—"It is but recently or at most a few years only that the mallet has been in use. I think to Wm. H. Atkinson, M.D., then of Cleveland, Ohio, but now residing in the city of New York, is due the honor of introducing it to public notoriety." In speaking further of it he says, "A mallet is a well turned and nicely formed piece of *lignum vitae* or *rosewood*, and is as harmless as quack medicine when let alone."

The cohesive property of gold was known to the manufacturers many years before it was employed by the dentists in that state, but the latter demanded a strictly noncohesive gold and the manufacturers found it difficult to always comply with the demand. Often they had to take back "sticky" gold and work it over again. In

writing for the *Cosmos* in 1863 Amos Westcott made the statement that he had accidentally discovered the cohesiveness of gold as early as 1840, by having some sent him by mail with the leaves of paper removed from between the sheets to save postage. The pressure in the mail sack caused the whole batch to stick together, and the manufacturers gave other gold for it, thinking the fault was theirs. He made no mention of nor profited by his discovery, and therefore did not get credit for it as he might have done. A few months later Dr. Louis Jack took Dr. Westcott to task for claiming the discovery, contending that it rightfully belonged to Dr. Robt. Arthur, who on making the discovery realized its importance and immediately made use of it, publishing the fact to the world about 1855, showing that liberal spirit which a strictly professonal man must possess.

This was the first period in the history of gold as a filling material. It was before the dental engine and the rubber-dam, yet it cannot be doubted for a moment that success crowned the efforts of these operators in the greater number of cases treated, even under the trying and almost distressing circumstances under which they labored in those days. Let it be remembered that this is a strong argument in favor of noncohesive gold and hand pressure.

Now comes a new era in which crystal gold and other fibrous cohesive golds made their appearance. The profession took to this new form as the trout seizes the tempting bait on the treacherous hook. It seemed just what they had been looking for—a soft, plastic, cohesive gold that could be worked by hand pressure. It soon proved, however, to be somewhat of a snare and a delusion, many failures rapidly following its use, principally, no doubt, from improper pluggers and inexperience in manipulation.

The third era, about 1863, saw the advent of the rubber-dam, the mallet, strictly cohesive foil and contour filling. Those who were bold enough to experiment with this new process were soon ready to cry out *Eureka!* The old soft foil and hand pressure gradually gave way to the more modern cohesive foil and hand-mallet force.

Then came the improved forms of pluggers, the machine and electric mallets, and from about 1880 to 1890 a man was an old fogy indeed who used anything but cohesive gold and mallet force. Through all these different periods and stages of development it must be remembered that gold persistently held its supremacy as a

filling material. With the advent of cohesive gold, however, and the long tedious operations necessary in its manipulation, the tired backs of the profession gradually turned for relief to the once despised amalgam. The state into which the profession had drifted gave this unscientific material a stimulus it had not known before.

But it soon became apparent that these beautiful cohesive jewels, so carefully hammered into place with the most modern pounding machinery, would in some unaccountable way become in many instances undermined by a recurrence of decay, principally at the cervical margins. The scientific investigators of the profession, to meet this last exigency, have resorted to the latest practice of "extension for prevention." It remains for experience to demonstrate what fruits this bold method will bring forth. While not dealing in this paper with cavity preparation, it may not be out of place to state that extension for prevention, in the fullest acceptance of the term as taught by those who practice it, is not concurred in to any very great extent. The cases are not plentiful where it can be practiced with good judgment, and in some of these it should not be done for esthetic reasons.

Let us consider the successes and failures attending the first period of the use of gold as a filling material. The form of gold used at this time was strictly noncohesive and the force exerted for condensation only hand pressure. The practice of extension for prevention could not have been followed, as it would have been impossible to have so shaped the cavities with the excavating instruments then in use. There was but one rule in cavity preparation—break down weak enamel walls, remove decay and make the cavity larger at the base than at the orifice. The gold in ropes and ribbons was packed in by hand pressure and finished by burnishing the surface. Such fillings were remarkably immune from a recurrence of decay, especially at the cervical margin. Where failure resulted it was from a battering down of the surface when subjected to severe attrition, until an exposure of dentin at one of these points would induce decay, either at the occlusal surface or at the labial or lingual margin. Who of us has not marvelled at the way such fillings have preserved teeth even after the latter have disintegrated to such an extent as to afford lodgement for food stuffs and bacteria in great quantity? To such a degree has this been the case that some mysterious therapeutic value has at different times been ascribed to noncohesive foil.

With the advent of cohesive gold the great annoyance of fillings breaking down from attrition was at once overcome and the ideal seemed for a time to have been reached. This was not to be, however, for ever since the introduction of cohesive gold and mallet force the profession has been harrassed by having these beautiful fillings, which required hours of patient toil from the dentist and stacks of nerve force on the part of the patient, become undermined at the cervical and labial margins and fall out—a welded polished lump of gold, with the support crumbled away as a wall built on a sand foundation.

The prediction is now made, that the next advance will be begun when we weigh the experience of the profession and profit by the principles which seem to have been proven. The high ideal hoped for will not be secured by inflicting undue punishment in burring away the strength and beautiful geometric form of the tooth in trying to get beyond a vulnerable point, but by combining modern instrumentation and skill with the two best forms of gold and the two best forces for condensation. Each of these methods has demonstrated by long experience that it possesses many virtues when rightfully used. This being true, let us use them in combination and reap the benefit of both. Pack noncohesive gold with hand pressure at these vulnerable points, thereby securing unmistakable adaptation, then finish with cohesive gold, thus obtaining the hardness and solidity necessary to resist the force of mastication, and the ideal method for the salvation of teeth, based on the experience of the past seventy-five years, will have been reached. It is not so much the extension of the cavity but adaptation that is most needed, and cohesive gold cannot be adapted to small inaccessible cavities. It is only in broad open cavities that cohesive gold can be successfully manipulated, hence the necessity for "extension for prevention" when this form of gold and mallet force is employed exclusively.

While not ready to make the assertion, the suggestion is advanced, that many failures of gold fillings from faulty adaptation are due to too much mallet force directly against the cavity walls in beginning the filling. This does not allude to the crumbling of the enamel rods under the blows of the mallet, but because it is going against a mechanical principle to endeavor to obtain an absolute adaptation to a resilient wall by driving a substance of the nature of cohesive

foil directly against it with a mallet. Ivory will stand a severe pounding without injury, and at the same time it is the most resilient substance known. For this reason it is selected for making billiard-balls and other things requiring this property to a great extent. If a piece of ivory be struck with a solid substance there is an immediate violent rebound, owing to its resiliency. If it be attempted to drive a piece of solid welded cohesive gold against its surface there is a rebound at every blow of the hammer, and the more solid and dense the welded mass becomes the more violent the rebound. It is therefore a practical impossibility to drive a layer of cohesive gold into absolute contact with it. If the process of condensation is not complete there is imperfect contact, and if carried to completion, so as to produce a state of solidity, there is incomplete contact because of the resiliency excited by the blows of the mallet. On the other hand, when steady firm pressure, as from the hand, is applied to a like substance, this resilient property is not excited and the materials may be pressed and packed into absolute contact with it. So, if with hand pressure we pack noncohesive gold into all the vulnerable points and around the cavity walls, until a mass of sufficient thickness to break the force of the impacting mallet has been condensed in this manner, cohesive go d may then be driven into it without the ill effects of the rebounding, as there is a non-resilient cushion to break the force of the mallet.

Discussion. *Dr. Wm. Crenshaw*, Atlanta: If a man could have only one kind, cohesive gold would be the best. I do not agree with Dr. Johnson that it is impossible to adapt cohesive gold closely to the margin of inaccessible cavities, for a large number of men have become expert by practice and can do it successfully. The latest and best method, however, is to use a combination of the two styles of gold. I formerly believed that cohesive gold was the best material for all parts of all cavities, but I now willingly acknowledge that noncohesive gold is the best for cervical margins of fillings. Regarding "extension for prevention," we all know that the point of contact of the teeth is where decay is most likely to occur, and if the margin of the filling comes at that point there is bound to be trouble. The cavity margin should preferably be half way between point of contact and gum. If it is at the gum line the same objection exists as at the point of contact of the teeth, so it is better practice to extend cavity under the edge of gum than to stop at it.

Dr. Frank Holland, Atlanta: I differ materially from the essayist, for an experience of twenty years with cohesive gold has convinced me that its value as a filling material cannot be surpassed. After seeing the work of Varney, Webb, and others, no one can deny that cohesive gold can be thoroughly packed with hand pressure against the cervical margins of a cavity extending to the neck of the tooth. The combination fillings described have not been successful in my hands, and I fail to see their value, as cohesive gold can be adapted to any case where soft gold could be used. It is sometimes almost impossible to so form a cavity that it will receive and retain soft gold, and the pressure brought to bear on the tooth in inserting such a filling is so great as to endanger it.

Dr. W. V-B. Ames, Chicago: Those discussing this paper seem to recognize only thoroughly noncohesive and thoroughly cohesive gold, but there are many gradations of working quality between the two, and therein lies the opportunity for Dr. Johnson's argument. "Extension for prevention" is what Webb taught years ago, but Dr. Black has amplified and extended it. Approximal cavities should be extended so as to bring the margins safely away from the point of contact and to make the filling of cavities simpler, but all cavities should not be extended to the degree of making them accessible to straight instruments.

Dr. R. K. Luckie, Holly Springs, Miss.: There is such a difference in the quality of teeth and in the way various people take care of their mouths, that no set rule for preparing cavities can be laid down, but "extension for prevention" should be carried out to a certain degree in most cases. In approximal cavities the gingivol labial or buccal or lingual angles should be extended freely whenever indicated. Better results also come from lateral extension, especially in teeth that are prone to decay. The mere fact of extending the cavity margin below the gum does not always save the tooth at that point, and it is not always so necessary to extend the gingival border.

Dr. W. J. Morrison, Nashville: We often see fillings of noncohesive gold that have been rendering good service and preserving the teeth for twenty or thirty years, but cohesive gold fillings rarely last more than half that time. This would seem to indicate that there is a more perfect adaptation of the soft gold to the walls and margins of the cavity than can be obtained with cohesive gold.

Many claim that there is something of a therapeutic value in noncohesive gold that prohibits the recurrence of decay. The use of both styles of gold in combination promises better results than can be expected from either alone.

Dr. Sims: Dr. Holland claims that it is necessary to extend cavities more to receive a noncohesive gold filling than a cohesive one, but I do not think this is so. It seems to me that an approximal filling with a noncohesive base and a cohesive finish canbe depended upon to preserve a tooth with less extension than any other filling, because the soft gold so thoroughly protects the margins.

Dr. A. G. Finney, Wilkesbarre, Pa.: I believe better results can be obtained from cohesive gold, and if we should study the nature of this material, and adopt our methods and instruments to its peculiarities, we would get better results.

Dr. W. E. Walker, Pass Christian, Miss.: Many of the failures of these combination fillings are due to the fact that too thick a mat of soft gold is left at the margin. Dr. Black showed me that the continued impact of mastication would still further condense the noncohesive gold under it, and thus allow the cohesive gold to settle away from the margins.

Dr. J. Y. Crawford, Nashville: The difficulty many have in using the different styles of gold comes from the fact that the proper instruments and methods are not adopted. At first we used non-cohesive gold with hand pressure and special instruments, and when cohesive gold was introduced the same instruments and methods were used, so failure of course resulted. There is no doubt that noncohesive gold in contact with the walls and margins of cavities is a better preservative of tooth substance than cohesive gold, and an ideal filling is one that has a foundation of the first and a superstructure of the second. Nowadays many dentists in making these fillings are trying to use the same instruments and methods for both styles of gold, and failures are bound to occur. A common sense plan in inserting a filling to preserve a tooth is to remove all decay and then so shape the cavity as to best retain the filling, adapting the latter to the nature of the tooth. The usefulness of a filling often depends upon the vitality of a tooth, and decay of a pulpless tooth is not analogous to caries in a living one.

Dr. Johnson, closing discussion: While not condemning "ex-

tension for prevention," I do not use it to any great extent. I believe it is Dr. C. N. Johnson who says that a cavity filled so as to have the margin of the filling extend beneath a healthy gum will never show recurrence of decay at that point. Probably it would not if the gum resumed and maintained a perfectly healthy condition, but I have never seen a healthy normal gum margin which extended over the filling.

Management of the Permanent Superior Incisors and Cuspids.

PAPER BY L. G. NOEL, D.D.S., NASHVILLE.

We believe no one will dispute the statement that cavities occurring in these teeth prior to the age of sixteen should be filled with cement or gutta-percha. Tin foil has been advocated by some very eminent authorities, but, admitting its low-conducting qualities and its benign therapeutic effect upon the dentin, it has not the easy working quality nor the adhesive properties of either of the above mentioned materials. It requires as much undercutting to retain it as gold, and it is as difficult to place. At this early age (eight to sixteen) we especially desire to avoid deep undercutting—we wish to remove only the decalcified and infected tissue, and we do not wish to pursue this in the direction of the pulp to the point of its exposure, preferring to trust to the therapeutic effects of our medicaments and filling material to convert this into a natural capping that will not prove inimical to the life and health of the pulp. Another serious objection to tin foil in the front teeth is its color and tendency to blacken in some cases, not only staining the surrounding tooth structure but indelibly pigmenting the gum tissue as well. We recognize the excellent qualities of this for other situations, but for these cases we have something better. Excluding tin brings us to a consideration of gutta-percha and cement.

Before entering upon this we must say a few more words about cavity preparation. These materials being plastic and easily introduced, we do not need to cut away the lingual wall of enamel for access, as in making preparation for gold fillings, but we desire to leave as much of the enamel margin as will protect the filling from abrasion in the friction of mastication or biting of food. This is an important point to observe in the preparation of cavities for cement

or gutta-percha fillings, since the latter are soft and offer little resistance. Gutta-percha, if of good quality and not overheated will when carefully introduced and well protected by the enamel margins, sometimes last ten years in proximal cavities in the front teeth, and since it has the least power of conducting heat and electric currents of all filling materials yet employed, it is perhaps the best agent we have for proximal cavities in the incisors and cuspids of young patients. The teeth should be well separated with thin, wide separating rubbers that will engage between the knuckles so as not to ride upon the gum septum. This separation should be maintained by forcing a bit of folded cardboard between the teeth until the soreness has subsided. Having obtained a satisfactory separation, and having decided upon gutta-percha fillings, our method of introducing them may be briefly described. We adjust the rubber-dam with great care, because dryness is essential. The edges are carefully everted and tucked under the margin of the gum by the silk ligatures, which are secured by the surgeon's knot. We next select a separator to steady the teeth and maintain the space. The preparation of the cavity is a very simple thing when conducted as above described, our attention being turned to the mere removal of decay and smoothing of enamel margins, no undercuts being required, save such as may be left by this procedure. A bit of cuttle-fish tape will be found useful in smoothing the enamel borders. We next paint the whole surface of the cavity with a solution of resin in chloroform. This serves a double purpose—it covers the surface of the sensitive dentin with a coating that protects the freshly cut dentinal fibrillae from irritants, and it affords a glue or adhesive cement for fastening the gutta-percha to the walls of the cavity. This is a decided aid in introducing the first small pellets of material since they cling to the wall of the cavity and are worked into place without moving.

The instruments for working the gutta-percha are few and simple, and have been too often described in text-books to require more than mere passing notice here. Such small serrated pluggers as are found useful in working gold will be serviceable in carrying the material into place. For a detailed description of the instruments and appliances needed in making gutta-percha fillings see Flaggs' "Plastics and Plastic Fillings." We cannot lay too much stress upon the importance of not overheating the material, for however

excellent it may be when it comes to the hands of the dentist, if heated too hot its color and all other good qualities will be quite destroyed. Many times failure has been due to a neglect of this caution, and the material has been blamed when the fault lay with the operator. The apparatus designed by Dr. Flagg for heating gutta-percha over water and keeping the instruments hot at the same time will be found well worth the money it costs. An oil pad should be kept at hand to oil the points of the instruments so as to prevent the adhesion of material. This will be found especially useful to prevent the dragging by burnishers.

Where the labial or lingual walls of enamel are broken, so that considerable notches occur in them, exposing the filling material to friction, zinc oxyphosphate cement will be found better and more lasting than gutta-percha. Care should be taken in preparing the cavity so as to leave as much of the enamel margin as is sound and resistant. A cement of well known integrity should be chosen, and it should be well mixed and introduced into a dry cavity (the rubber-dam having been previously adjusted), time should be allowed for it to set awhile before exposing it to the action of the fluids of the mouth. We doubt the propriety of subjecting zinc phosphate fillings to the heat of instruments for melting waxes and resins upon their surfaces, and when this is done the filling should first have time to set well. A comparison of cases leads us to think we have obtained probably better results without the wax.

The next question to decide is, when shall the teeth be filled with gold? Several considerations will enter into this decision—First, how is the temporary filling lasting? If it is standing well and maintaining its color and integrity it should not be removed, no matter whether it is cement or gutta-percha. Many a called temporary filling proves to be more permanent than the called permanent fillings. Dr. Flagg has called attention to the fact that failures in gold fillings are always accompanied by extension of the cavities, but such is seldom or never the case with cement or gutta-percha fillings. We may have a wasting or disintegration of these plastics, but the cavity is left the same size as before. We should not dare risk the employment of gold until such time as the teeth shall have completed their growth, the dentin has become dense, and the mouth is in a thoroughly hygienic condition.

From an experience and close observation of thirty years we have

come to the firm belief that in the majority of normally placed teeth it is good practice to cut away a portion of the lingual wall of enamel, leaving a self-cleansing space, and we can deduce some very convincing arguments for this practice. Where sufficient separation is obtained by wedging to place these fillings without cutting away any of the lingual wall, after removal of the wedges the flat surfaces of the fillings come together in such manner as to retain particles of food which undergo fermentation and decay quickly recurs. The lingual enamel is much thinner than the labial plate, and besides being thinner is corrugated and very prone to cleave along the lines of corrugation, so that when cavities are large, leaving these inner plates of enamel unsupported, if they do not crumble under the force necessary to condense the filling, they are sure to split away in sufficient quantity shortly afterward to furnish roughened edges that afford lodgement for fermenting substances, and extension of the cavities is the result. When the lingual borders are cut back somewhat, as described by Dr. Robert Arthur some years ago in his little book on "The Treatment and Prevention of Decay upon the Proximate Surfaces of the Teeth," a permanent separation is maintained and no opportunity is offered for the lodgement of harmful substances. A self-cleansing space is maintained, and a comparison between this and the above described operation will show a result overwhelmingly in favor of the latter method. I have several patients whose front teeth I filled in this manner twenty-five to thirty years ago, and the fillings are as good as upon the day of their insertion. Furthermore, I have had abundant opportunity to observe this durability in similar work at the hands of older operators. It sometimes seems a pity we did not all abide by our first teaching—permanent separation and filling from the lingual side of the teeth with non-cohesive gold—for much of the modern cohesive gold work is far inferior. Fillings of cohesive gold placed at the knuckles of these teeth, first obtaining wide separation and then letting the teeth fall back into place, allowing enamel margin to meet enamel margin, seldom last as long as five years, and I have seen the cavities extending in six months. The plan of cutting away the lingual enamel entirely, and building all back with cohesive gold may be a little better, but I have seen many sudden failures following such work.

Returning to cavity preparation, we would emphasize and repeat

the statement that easy access is obtained by this cutting away of the lingual wall of enamel. The natural convexity of the labial plate will give an anterior retention, besides which little more than straight lines will be needed for other parts of the cavity, but to facilitate the placing of the gold and to ensure its retention there can be no objection to a slight groove along the gingival margin. The nicest care should be given to enamel margins, and here the magnifying lens should be brought into frequent use to see if perfectly smooth margins are being obtained. Just here we cannot refrain from entering our protest against the practice of drilling small pits into these cavities for anchorage—the so-called pot-leg anchor. These are always a menace to the pulp, are tedious and difficult to fill, are unreliable and insecure, it is impossible to know that you have filled them perfectly, and when imperfectly filled they are always a starting-point for new decay. They are unnecessary even when only cohesive gold is to be used, as quicker and more secure anchorage can be obtained by cutting a slight groove with hoe or bur along the gingival margin, slight convexity will be left under the curving labial plate, and all other walls may be left straight or nearly so. There is no reasonable objection to a very slight undercut at the incisive angle. These are sufficient, safe and easily filled.

We should like to make an argument here in favor of noncohesive gold for all simple cavities between these teeth, instead of cohesive. We prefer the preparations of noncohesive gold that are supposed to have that property imparted to them by the deposition of some foreign substance upon the surface, notably the foil made by Abbey. This we believe to be especially indicated in the case of young subjects, and in all cases where the pulps manifest extreme irritability. We believe it to possess a lower power for conducting heat and electricity than the strictly cohesive gold, probably because the interposition of a film of foreign matter between its leaves breaks the continuity. We employ semi-cohesive gold in all cases where cavities have become so extensive as to require the addition of cohesive gold to their surfaces for the restoration of contour. In cases involving loss of portions of the labial or lingual plate of enamel, or compound cavities extending to two or more surfaces, we may combine foil with pellets or cylinders of strictly cohesive gold.

Discussion. *Dr. T. P. Hinman*, Atlanta: I have always used

cement for the front teeth of children, but have not obtained so good results as Dr. Noel claims for gutta-percha. I occasionally have a patient whose mouth contains perfect fillings of soft foil put in thirty or forty years before, and I doubt whether many of the cohesive gold fillings inserted to-day will last so long. The use of the mallet force in dentistry has reached its maximum, and from now on will probably decrease, giving way to hand pressure, and work will be better because of it.

Dr. H. E. Beach, Clarksville, Tenn.: I use tin in the case of young persons whose teeth decay before the dentin has reached its normal hardness, and I have never observed the discoloration of the gums referred to by Dr. Noel. If tin will preserve these teeth that are in the formative stage until nature has hardened the tooth substance so that they can be safely filled with gold, it should be used even if the gums are slightly discolored in rare instances by it. I have patients whose anterior teeth when forming I filled twenty-five years ago with tin, afterwards replacing it with gold, and those teeth are well preserved to-day. I have seen fillings of tin on the lingual surfaces that are intact after thirty years of service. Even in using gold I place a mat of tin-foil against the cervical wall of the cavity, believing that it has a therapeutical effect in contact with dentin, helping to preserve the tooth from a recurrence of decay. Gutta-percha has not the durability of tin, but when properly used is better than any other plastic filling for children's teeth. Cements are not impervious to the fluids of the mouth, and are readily acted upon when the saliva is alkaline.

Dr. J. Y. Crawford, Nashville: I do not agree that no permanent fillings should be made until the age of sixteen is passed. I would speak a word about the necessity for regularity of the teeth. In almost every case where an incisor in the lower jaw is out of place there is a corresponding displacement in the upper jaw. All misplaced teeth should be put in position before they are filled, as otherwise it is impossible to properly prepare cavity and insert filling.

Dr. J. P. Corley, Greensboro, Ala.: I believe in permanently separating the anterior teeth so that they will not be affected by caries again. Where the proximal corners of incisors are broken down I make a separation and partial contour instead of restoring the contour. I should prefer to cut the teeth slightly apart rather than to see gold fillings in the front of the mouth.

Dr. H. W. Morgan, Nashville: I am much surprised to learn that gutta-percha is impervious to the fluids of the mouth, also that fillings of same can be so easily inserted. In fact, I cannot agree with these statements. Gutta-percha contains oxid of zinc, and I have never removed a gutta-percha filling which did not prove by its odor that it was leaky. I favor the insertion of approximal fillings between incisors, by cutting away the labial plate, and I then do not restore the contour, but give the filling a dull surface by the use of cuttle-fish strips. I use rubber for separating teeth, and believe that those who condemn it do not know how to use it properly. It should not be left between the teeth twenty-four hours, but only six or eight, as this will give all the separation necessary, and gutta-percha will then keep the teeth apart until all soreness has subsided. Two days later they will be in fine condition to be filled. Pigmentation of the gum tissue found with tin fillings is probably due to particles of disks which have penetrated the edge of the gum when the fillings were being inserted, and if they were washed out there would be no discoloration.

Dr. W. E. Walker, Pass Christian, Miss.: As I understand it, Dr. Noel advocates only the removal of the linguo-approximal marginal ridge, which has the effect of increasing or widening the lingual embrasure, thus decreasing the labio-lingual diameter of the middle and cervical thirds of the approximal surfaces without reducing the thickness of the occlusal third and especially not disturbing the natural points of contact. This does not differ from the Arthur system, except that it is limited to the upper incisors. In this location I have used it with marked satisfaction and invariably beneficial results, each year increasing my confidence in it. The only objection to it is the amount of time required to properly shape and polish. The cavity should always first be excavated, so as to leave no doubt as to its limited depth, provided there is objection to this shape, were a filling still to be inserted, though there would be no valid objection to thus shaping the surface and then filling the cavity, as the liability to recurrent caries at the margin of the filling on a surface shaped as described is greatly reduced, owing to the greater facility with which the surface can be kept polished. It thus partakes partly of the nature of a lingual surface. Dr. Corley asks if I ever cut away this lingual embrasure without touching up the point of contact, and I would say yes, and

if the knuckle needs polishing it can be done, but it is not at all part of the operation.

Dr. Noel, closing discussion: I have been somewhat misunderstood, as I should conserve the labial plate of enamel as much as possible in every case. Further, my operation refers only to the superior incisors, as the lower ones are not so liable to decay on their approximal surfaces, and as they are smaller, with contact points close to the cutting edges, they are more easily reached from the front when it is necessary to fill on the approximal surfaces.

Consideration of Conditions of the Interproximal Space.

PAPER BY DR. J. T. MEADORS, COLUMBIA, TENN.

However simple this subject might seem to one at first thought, after a few moments of reflection he soon sees that there are points of very great importance to those practitioners who are desirous of producing the results which are most satisfactory to the comforts of their patients and the durability of their work.

Before entering into the consideration of the subject, you must first know the condition as it normally appears, hence I will briefly refresh your minds as to the anatomical and physical makeup of the interproximal space. When the teeth occupy their proper position in the dental arch, their proximal surfaces are supported one against the other at a point near to the occlusal surface of the teeth, known as the contact point, causing by such an arrangement a triangular form between the teeth, the basis of which is made by the border of the alveolar process and apex at the contact point. This space is normally filled with gum tissue which has an arched form bucco-lingually, the crest of each arch being near to the contact point. Provided the point of contact is small, while masticating any fibrous foods the mass is severed at this point of contact, and as a result of the form of the gum tissue, as well as its elasticity, the food is passed from the region of the interproximal space.

When by decay the proximal surface of a tooth is lost, especially when the decay has been so extensive as to cause a breaking down of the proximo-occlusal border, the teeth seeking support one against the other move closer together and thereby nearly obliterate the

interdental triangle, causing the gum tissue to festoon abnormally on the buccal and lingual surfaces. Because of the improper contact of the surfaces of the teeth, fibrous material and foreign matter wedge into this space and crowd the gum tissue in such a way as to reverse the arched arrangement, and by decomposition cause an inflammatory condition of the tissues adjacent thereto. In such cases and under such conditions you will find that of necessity your first act will be to separate the teeth by use of cotton or gutta-percha, and restore the original conditions by properly inserting a filling so contoured as to produce a contact point near to the proximo-occlusal angle, not broad but of sufficient strength and density to prevent the wear of the point by lateral motion of the teeth while masticating. The interdental triangle having been restored, the abnormal festoons soon disappear and the gum tissue resumes its natural crest form. Should you make the contact point broad and the surface of your filling flat, you will find the wedging of foods into this space a source of great discomfort to your patient and a too frequent cause of failure of your filling.

Upon careful examination of a set of teeth properly arranged in the arch, which can best be studied by inspecting a skull, you will find the point of contact of each tooth very small, practically of not sufficient width for measurement, and varying upon the surfaces of certain teeth. Close inspection will reveal the fact that the point of contact upon the superior bicuspids and molars is nearer the buccal surfaces than the lingual, whereas in the lower arch the contact point is nearer midway between the buccal and lingual surfaces. You will also find as a rule a great difference in the surfaces of the teeth, for instance, the first superior molar is upon the mesial surface prominent at a point towards the bucco-occlusal angle, and then falls away very rapidly towards the gingival and towards the lingual, whereas the distal surfaces of all molars are decidedly rounded and broad, falling away to the gingival. The most decided difference in the location of the contact point is observed in the case of the bicuspids, the point with the superior bicuspids occurring decidedly towards the buccal, whereas, because of their rounded form, the point with the lower bicuspids occurs nearer midway between the buccal and lingual surfaces.

Your attention has been called to these anatomical conditions in order that when inserting gold fillings or constructing gold crowns

you may as closely as possible imitate nature. I have always favored making the contact point upon my fillings in the superior bicuspids nearer midway between the buccal and lingual surfaces than occurs in nature, because I desire that after the food is parted both the buccal and lingual borders of the filling may be equally polished by the passing of an equal amount of food over each margin.

Another condition which too often causes discomfort to your patient and failure of otherwise good work is the overhanging of filling materials. In large cavities upon the proximal surfaces, especially where the filling extends beneath the gingival margin, it is hard to know that you have removed all the overhanging material. With gold you find it difficult to polish down to a smooth surface flush with the enamel margins, and with amalgam you frequently find upon the return of your patient that some of the material while soft has worked up beyond the cavity margin, and has set and become a source of irritation to the tissues of the interproximal space. Other conditions, such as accumulation of calculus or wedging of broken toothpick or straw into the interdental space, are common to us, as we have these to deal with daily because of the discomfort of our patients. All of this I cite because of the too little regard we as a profession have for the proper care of this important space. The operator who files between teeth and reverses the interdental triangle, no matter how dense may be his filling, or how flush it may be against the enamel margins, has by reversing this triangle done his patient a very serious injury.

In testing the proper relation of teeth one to another as regards the interdental space the floss silk is of greatest assistance. In passing the floss between the teeth you will find that it is brought to a stop at a point near the occlusal border, and with some little pressure it snaps into the interdental triangle and moves laterally with proper freedom. Upon removal you will find that the floss passes over the surface of either tooth with ease until you again reach the contact point where you are required to use a little force to remove same.

A proper knowledge of the anatomical and physical condition of the interproximal space, with careful manipulation of his materials, and with the desire for the reestablishment of the contact point, and the determination to make the best of means at hand, classifies the operator as one of those of whom Milton Young wrote:

"Thy purpose firm is equal unto the deed,
He who does the best his circumstances allow,
Does well, acts nobly, angels could do no more."

Discussion. *Dr. Gordon White*, Nashville: This subject is an interesting one, but I am disappointed because the essayist did not give us a single new idea. The only thing that I noticed was the use of gutta-percha for separating teeth, but this method is too slow to be practicable. Gutta-percha is used to hold the teeth apart after they have been separated by cotton or other agents, but this is all, and if Dr. Meadors has some special plan he ought to explain it.

Dr. J. H. Crosslands, Montgomery, Ala.: Dr. Bonwill taught the profession years ago how to separate the teeth with gutta-percha, and I supposed the method was common practice with all dentists. Dr. Meadors has done well to repeat and to impress on all of us that the interdental spaces must be protected and guarded, so that food will not be driven by mastication between the teeth and into the gingival tissue.

Dr. R. K. Luckie, Holly Springs, Miss.: In societies we often have papers and clinics that are not new, but where they clearly teach a useful lesson they are worthy of repetition. When cotton is used it must be renewed each day to secure sufficient separation, but one plug of gutta-percha can be left for several days, and it will gradually widen the space between the teeth.

Dr. M. C. Marshall, St. Louis. Such papers as this have been read for years, but nevertheless all members of the profession are not familiar with the principles set forth, as is evidenced by the work which we see is the mouths of their patients. Working without separation causes serious trouble.

Dr. W. V-B. Ames, Chicago: A Chicago lady while visiting in Philadelphia called on a prominent dentist for service. Her teeth had a great many interproximal cavities, and the dentist used pink base-plate gutta-percha to secure the necessary separation. The lady was soon after taken sick and went to the seashore, returning direct to Chicago. By this time the separation between her teeth had become so great that her face was actually deformed by the protrusion of her front teeth. I removed the gutta-percha and filled the teeth, and they returned to their proper positions. I would warn you all not to leave gutta-percha between the teeth too long, thinking that it is not active.

Dr. W. E. Walker, Pass Christian, Miss.: I believe it is well to repeat these important points of practice, as we are all benefitted thereby. In a simple cavity between the teeth gutta-percha is a good filling material, but in a compound cavity of the approximal mascitatory surface there is scarcely a limit to the separation that can be secured by using the tough pink base-plate gutta-percha.

Dr. Gordon White: Gutta-percha as used by Dr. Bonwill was not intended for separating, but was a filling material and remained in the teeth for years. By the force of mastication gutta-percha can be pressed down between the teeth, and if left long enough it will be pressed into the gingival border and cause inflammation.

Dr. Meadors, closing discussion: Notwithstanding Dr. White's criticism I am pleased that my paper has brought out such a full discussion. I do not pretend that it has any absolutely new ideas, but many dentists fill approximal cavities without securing the proper separation. so the points I urged are of enough importance to to be frequently repeated. When separating, I fill the approximal cavity with the gutta-percha, leaving some excess, and by the force of mastication it is forced between the teeth and separates them.

Inflammatory Phenomena Due to an Unerupted Third Molar.

PAPER BY J. P. CORLEY, D.D.S., GREENSBORO, ALA.

A woman, fifty-three years old, presented for treatment and gave the following history—Three months previous she had felt pain in the region of the right mandible, which grew steadily worse for several days until it became constant and severe, involving the entire side of the face, head and neck. The affected area soon began to swell, and the edema became so exaggerated that the head could not be moved and the eye on that side was closed. The patient was prostrated, and her temperature rose to 104 degrees. The attending physician, realizing the obscure nature of the case, called in a rhinologist, who, after an examination, stated that the post-nasal, antral and auricular regions were in a perfectly normal condition. A dentist next examined the case, and from the subjective symptoms he suspected an unerupted third molar. An examination, however, revealed no clue to such fact. The extreme swelling, in-

ducing partial ankylosis, made examination unsatisfactory. The patient's condition grew alarming, as she became unconscious and remained so for four or five days.

The surgeon who was in consultation made a free incision through the masseter muscle at a point opposite the maxillary tuberosity. There was a free discharge of congested blood, but it gave no relief. Then the dentist made an incision on the inside of the mouth in the internal angle of the ramus, but without result. After this the surgeon made the external opening deeper, and there was a liberal discharge of pus. Then the patient began to improve, and after a few weeks had sufficiently regained her strength to make a trip to Sewanee. Her physician there kept the incision open with drainage, and made daily injections of peroxid of hydrogen. Whenever this was not done the swelling and pain would return. A surgeon from Nashville was consulted and made some explorations with a bistoury, but found nothing except a hard substance which he took to be necrosed bone. He made a free opening into the mouth well back on the border of the alveolar process, and injected peroxid into the internal opening also. All efforts, however, to divert the pus from the external incision were futile. The physician in charge, who is one of the most scientific men in the profession, came to the conclusion that a third molar must be at the bottom of the trouble, so he brought the patient to me.

Upon examination I found that the mouth contained a full upper denture and the six lower anterior teeth, the rest of the lower teeth having been lost for a number of years. The mass of connective tissue which had formed in the buccal region prevented the mouth from opening to its normal extent, but I found the sinus which the surgeon's bistoury had made and which had been repeatedly opened for the purpose of injecting peroxid. I introduced a probe and some distance from the surface struck something which gave the characteristic feel of enamel. I therefore enlarged the opening and packed with a cotton tampon. An examination of the extra-facial fistula revealed the presence of a number of fistulous tracts radiating in several directions. It was necessary to follow the peroxid injections with a blunt probe to allow the free escape of the effervescing discharge. I kept up the tampon dilations together with a little cutting away of the tissues, until the anterior buccal cusp of the tooth came into view. I was then able to outline its crown and

found that its position was upward, inward and backward, instead of forward, as is usually the case. The patient had been under a tremendous strain for three months, and in consequence was extremely nervous and histerical, which made the work trying to both patient and operator. Cocain was used freely, but owing to the abnormal condition of the tissues its effect was limited and unsatisfactory. An application of nitrate of silver was made after each operation.

When sufficient of the soft tissue had been removed to expose the supra-alveolar portion of the crown it was seen that only the anterior half of it was above the process. A portion of the latter was therefore cut away and an effort was made to extract the crown, but the beaks of the forceps could not grasp it sufficiently to bring much force to bear. Furthermore the mouth could not be opened wide enough to make the application of fraction in the long axis of the tooth, and for the same reason it was difficult to use a right-angle bone drill. After consultation with the surgeon I dissected out practically all of the connective tissue in the following manner—The parts were injected with cocain, artery forceps were snapped on, and the tissues were quickly enucleated. Peroxid of hydrogen was dashed in to check the hemorrhage, and the entire side of the mouth was packed with sterilized cotton. The enucleated mass presented a number of radiating sinuses.

At the next sitting I endeavored to extract the tooth, but in vain, and in a fit of desperation I locked the beaks of a pair of cow-horn forceps around the crown and pulled it off bodily on a level with the roof of the pulp chamber. The pulp had a reddish brown appearance and gave no response when a broach was introduced. There was no evidence of putrefaction in or around the tooth. The wound was again packed, and a sitting arranged for next day, at which time a right-angle drill was used to cut a slot down through the alveolar process between the labial plate of the bone and the roots of the tooth. The blade of an elevator was then introduced, and by a twist of the wrist the root was lifted out. A small, round posterior root was present and possessed a perfectly norman exterior appearance, but the anterior aspect showed a coalescence of two distinct roots with three or four canals. On the apex there was a small exostosis which was apparently the only structural abnormality. Upon probing the alveolus I gained no information, being

disappointed in the search for a sinus or fistula leading out to communicate with the extra-facial fistula.

The patient made a rapid recovery, and is now, ten months after operation, perfectly well. There is a slight scar, but no depression. Removal of the mass of fibrous tissue and sinnses perhaps prevented contraction of cicatrix. The clinical history of the case is unique and its cause obscure. I am reporting it in the hope of gaining either by discussion or through the dental journals some knowledge of its etiology.

Discussion. *Dr. J. J. Sarrazin*, New Orleans: I saw the tooth in this case, and concluded that the bulb at the end of root was not an exostosis, but most likely a serumal calculus, as the fact that the tooth was entirely surrounded by and buried in the alveolus would preclude the formation of a salivary calculus. The trouble may have been caused by this calculus. I cannot imagine why the first incision in the neighborhood of the parotid gland was made, as it could not reach the locality involved.

Dr. A. R. Melendy, Knoxville, Tenn., asked if the X-ray apparatus would not have located the unerupted tooth at once and have furnished a clue to the cause of trouble; and *Dr. T. P. Hinman*, Atlanta, replied that within three minutes the tooth could have been located with the X-ray so that the operation for its removal would have been definitely determined.

Dr. S. W. Foster, Atlanta: I long ago learned not to attempt to extract by ordinary methods an impacted third molar which was imbedded in the alveolus. My method is to cut away the alveolus over the tooth with a fissure bur, freeing the tooth, so that it can be easily lifted out.

Dr. J. E. Chace, Ocala, Fla., asked if there was any indication of uric acid diathesis in this case to account for the formation of the calculus on the root of the tooth, and *Dr. Corley* answered that there was none, either in the patient or in her family.

Dr. W. E. Walker, Pass Christian, Miss.: I would ask if any saliva came from the fistula. In surgical works the word fistula is used to describe an abnormal canal for a normal fluid, while a sinus is an abnormal canal for the discharge of fluids such as pus, resulting from diseased conditions. The appearance of the calculus would determine whether it was salivary or serumal, and if the former, the saliva must have had access to the tooth.

Dr. H. E. Beach, Clarksville, Tenn. I had a case which was somewhat similar to that of Dr. Corley. A woman wearing artificial teeth came to me suffering with a pain which her physician had pronounced neuralgia arising from her state of pregnancy. I found an enlargement in the angle of the jaw, and upon lancing it secured a copious flow of pus. I therefore diagnosed an unerupted third molar, but on account of patient's condition thought any operation should be deferred, so simply dressed the wound and dismissed her. She was all right for a time, but a few weeks later the trouble returned and the pain was so severe that it seemed best to remove the tooth at once. I therefore enlarged the incision already made and dissected away the overlying tissue, then with a fissure bur cut the process from around the tooth, uncovering it. I found it lying with its crown pointed toward the ramus of the jaw, and easily lifted it out. Dr. Corley was very fortunate as well as skillful in the treatment of his case, and I think he has asked some pertinent questions.

Fracture of the Jaw—Report of Two Cases.

PAPER BY H. H. JOHNSON, D.D.S., MACON, GA.

I report these two cases with the hope of aiding some one by method and suggestion who may be called upon to treat those suffering from similar accidents. The first case was a fracture of the superior maxilla of a boy thirteen years old from a gunshot wound. The bullet entered at the end of the nose, high enough to miss the apex of the incisor teeth. It ranged in a glancing direction towards the unerupted cuspid tooth, and evidently hit it squarely, as it carried the latter through the cavity of the antrum and lodged it in the posterior wall. The boy was carried to the office of a surgeon, who made an incision in the cheek opposite the point where the bullet had been located and removed the cuspid tooth. While he was attempting to remove the bullet it in some way fell back into the deep cavity of the bone, and was not afterward located or removed, as he did not have access to an X-ray apparatus.

There was a complete fracture of all that portion of the bone containing the bicuspid and molar teeth, and it was entirely detached from the main body of the bone and had dropped down, being sup-

ported only by the soft tissues of the mouth and the muscles of the cheek. The sockets of the teeth were not much disturbed, as all the teeth were firmly rooted in the detached portion of bone, except the first bicuspid which was knocked loose and hung merely by a membranous attachment.

After the surgeon had carefully removed all the fragments of bone from the track of the bullet I was consulted as to the possibility of saving the teeth and the piece of bone containing them. I hurried to the surgeon's office, and found the patient still under the influence of the anesthetic. After making a hurried examination, and obtaining the facts as above stated, I decided to make a splint for the teeth, but realized that it had to be done in a hurry. I therefore took an impression in modelling compound and made a model, but after obtaining the latter I found that in pressing the material into position I had slightly misplaced the broken parts. This was corrected by sawing the model at the point of fracture, fixing the displaced portion in position, and again fastening the model together. Dies and counterdies were made, and a gold splint was swedged to fit over the teeth in the arch, extending from the second molar at the point of fracture around the arch to and including the incisors, which, being strong and firm, were to act as the support for the broken and displaced part. The teeth were dried off and the appliance cemented firmly to place. I was careful to press it into the exact position on the incisors, as this was the only guide to the natural position of the fractured body of bone. To prevent the displacement of the splint by having it accidentally bitten against, a vulcanite support was constructed a little thicker than a gold splint and cemented onto the bicuspids and molars on the other side to raise the bite.

The patient was very comfortable with his splint on, and it was allowed to remain in place six and one-half weeks. At no time was there a rise in temperature of more than one degree. When the splint was removed all the broken parts were found firmly united, there was no irritation of the soft tissues of the mouth, and everything presented a perfectly normal condition.

The second case was the fracture of the outer plate of the inferior maxillary bone, including the four incisors. This plate of bone, representing one-half of the sockets of the teeth, was split off, carrying the teeth attached to it, but there was still an attachment of soft

tissue. The parts were put back in place, and the broken plate of bone had a sort of dovetail and fitted so firmly into place that it was not deemed advisable to make a splint. The success of this case was very gratifying, as it healed perfectly and left no visible scar.

Discussion. *Dr. J. E. Chace*, Ocala, Fla., asked if the impression of the lower jaw had been taken to make sure of the occlusion. *Dr. Johnson* replied that he had not been called until the patient had been under ether for two hours, and there was then no time for him to think, but fortunately the articulation was perfect.

Oral Hygiene.

PAPER BY DR. J. P. CORLEY.

The practice of oral hygiene has long been limited to the narrow confines of the oral cavity, and its most ardent devotees have done little more than insist on cleanliness and proper exercise of the teeth. This, of course, has been in keeping with the mechanical basis upon which our science was premised, but with the advance in dental education, which guarantees to the graduate dentist of to-day a knowledge of biology almost equal to that of the medical profession, he is qualified to institute a broader and more thorough system of hygiene.

The great barrier which stretches its spectral arms across his path is the public's impression that the teeth are things apart, free from the influence of environment, and destined for all time to run a prescribed course, amenable only to operative intervention. Also, the popular impression that the dentist is in fact a *toothist*, pure and simple, as though the object of his care existed as in a test tube. We have been toiling through the tedious years that we might bequeath to future generations more perfect dentures, with approximate immunity from the need of patchwork, yet we have not required that cooperation and assistance from our clientele without which our efforts must ever result in failure. The day when a man could afford to retain a patient who habitually and wilfully neglected his dental organs has passed. On the other hand, the public has been slowly taught to appreciate the intelligent dentist. His

people recognize in him the artistic scientist and are usually willing to enter into the spirit of his profession.

It is mainly through the mothers that we can hope for a hygienic regime which will be truly prophylactic in its last analysis. Clinical observation, as well as scientific research, prove that the period of greatest susceptibility is during the time when the patient is still under the care of his guardian. This fact is both suggestive and encouraging. Habits of cleanliness and laws of health can be enforced, and when established at this early age will be more permanently maintained. Then, again, if this critical period be passed with freedom from serious decay comparative immunity will follow. The two great channels through which we can hope to reach this maternal head are the medical and educational professions. It is encouraging to note that some of our medical schools have regular lectures on oral hygiene, as the M. D. thus goes into practice with a greater appreciation of the importance of a prophylactic regimen, and also with some knowledge of a practical dental toilet. Some of the public and normal schools are having illustrated lectures on the subject and are beginning to enforce its technical observation. Let us use our individual and collective influence to further the work in this direction.

After all, however, there is an opportunity which comes to each of us alike, and may be used to greater or less advantage by all—the constant teaching at the operating chair, and a demand for the courtesy due us. To do this with success we must study the individual patient as we would a book. We must know what to say and when and how to say it. Above all we must be firm and uncompromising in our demands. The work is of so great magnitude that the efforts of a few individuals can accomplish but little. Every state, sectional and national society should have a standing committee to push the work and work in harmony with the national committee. These committees should have a representative at every medical and educational meeting in the country.

We have had the privilege of presenting the matter to both of these professions in Alabama and have met with nothing but encouragement from all. I say that the land is ours if we will but rise and possess it. Let us take advantage of the great tidal wave of interest which is to sweep over our country, the advance indications of which are before us, and by a thorough preparation for the exigencies of the hour press the work of hygiene and prophylaxis.

Discussion. *Dr. H. W. Morgan*, Nashville: This subject has attracted attention from time immemorial, and I am glad to know that some good missionary work is being done among the school children. That is the place to begin. If we are to do this work and do it in such a manner that there will be no opportunity for unworthy men to get hold of it in a way to advertise themselves, it will do a great good. It is work that will have to be done over and over again each year, because you do not have the same crop of children to deal with, so there will be no end to it. Much can be done through the school teachers, if you can get them interested in it. Our school board some years ago prepared a circular letter that was sent to all of the teachers, and they were requested to read it to their classes twice a year. Some of the teachers took a great interest in the matter and did a great deal of good in their schools. I think dentists should make more effort to impress the necessity of greater care of the children's teeth upon their patients while they are in the chair. This is a golden opportunity. While the patients are suffering from the neglect of their own teeth teach them that care will preserve the teeth of their children. They will be apt to heed the advice when they realize that the pain they are suffering is the consequence of their own neglect of these important organs. There is a great sentence which old Dr. Freeman frequently repeated to his patients—"Clean teeth do not decay." Many of my own patients have thanked me for that saying.

Dr. Corley said it was well for poor human nature that there were some bright spots along life's pathway. He was getting to the point of believing that oral hygiene is the foundation and superstructure of all dental practice. Dr. Walker, chairman of the committee on oral hygiene of the National Dental Association, has furnished blanks to be sent to dentists and to the superintendents of schools for the purpose of having examinations made of the mouths of school children. To avoid the possibility of jealousy, all the professional dentists in each of the smaller towns should unite in the work and do it together or alternately, or by agreement select some one to attend to it. When the examinations are made each child is given a blank with a report on it of the condition of the teeth. This they carry to their homes and it serves to call the attention of their parents to the subject and post them as to the needs of their children. He did not think there was any danger of this

work being a help to the quacks. The mere fact that the professional men were doing the work, and were doing it unselfishly, would bring the parents to appreciate the difference between the professional and unprofessional dentists. The fact that we do not have the same children year after year is an advantage for us, as we will thus have more missionaries to carry the work on in the families. Oral hygiene does not benefit the teeth alone, for the sense of taste depends largely on the cleanliness of the mouth, while the health of the whole system may be and often is wrecked because of the lack of proper mastication due to imperfect teeth.

Crown Work.

PAPER BY H. H. JOHNSON, D.D.S., MACON, GA.

There are so many systems of crown work that at first thought it would seem almost superfluous to add another, but when we remember that we have not in all the number what might be termed an ideal bicuspid crown, we feel justified in attempting an improvement. The Richmond bicuspid crown is strong and durable when well made, but has the objectional feature of a great display of gold about the occlusal surface, furthermore, the facing is liable to be checked in soldering.

With the consent of Dr. J. Y. Crawford I herewith present one which should rightfully be termed the Crawford crown, and it will be found to be almost if not quite the ideal crown. Dr. Crawford has worked it up by embodying some of the old Richmond ideas with original ones of his own. It is made as follows—The root is prepared by grinding it off about even with the free margin of the gum, avoiding any oval or round shape at the end and removing any bulging shape at the sides. The canals are then enlarged for the reception of platinum posts, not forgetting to ream out with a large bur the orifices into a counter-sink. A band is carefully fitted about the circumference of the root, to which a flat top is soldered, forming a cap. This flat top is placed on the root and burnished down into the counter-sink orifices of the pin-holes. The holes for the pins are now punched at the indicated spots, the pins placed in position, the whole removed and the pins soldered in place from

the upper side, filling the counter-sunk holes about the pins flush with solder. The cap and pins united are now placed back on the root and a bite and impression taken, from which an articulating model is made and mounted in an articulator.

The gold cap is now on the model which represents the mouth, and the pins are left projecting above the surface of the cap. Grind these off even with the top of the cap. The tooth is now selected, and it must be a vulcanite bicuspid. Adjust this to a proper occlusion by grinding off perfectly flat at the base, allowing it to fit flat against the top of the gold cap. Now with a strip of thick tinfoil take a measure of the circumference of the bicuspid tooth and make a gold band deep enough to reach to the grinding edge on the palatal side. Trim the band down to a narrow strip on the buccal side, press the tooth into this band and burnish the edges to a perfect adjustment. While the tooth is still inside it, grind or file off the base of the band flat and even with the base of the tooth. Remove the tooth and place the band, narrow edge front, on the gold cap and solder together with a minimum amount of solder. If the band fails to fill out to a proper contour on the palatal side, this deficiency may be remedied by thickening it with solder at that point. After polishing the cap and band, the crown is completed by cementing the porcelain bicuspid firmly into place in the half cup which was soldered to the root cap. When this has been allowed to set hard out of the mouth it is ready to be cemented onto the root in the mouth and the job is completed.

We now have a very strong, natural looking crown, with a proper occlusion and showing a minimum amount of gold. The final result of the work is never in doubt from the beginning, as the porcelain tooth never goes into the fire and there is no checking or other failure. This description of the method may appear somewhat voluminous, but it should not deter anyone from attempting to use it, as in practice it will be found not to take longer than the making of a Richmond crown, and in many ways it is more satisfactory.

Amputation of the Roots of Teeth to Cure Abscess.

PAPER BY GORDON WHITE, D.D.S., NASHVILLE.

I first performed this operation for a lawyer in October, 1886. The whole upper portion of the root was denuded of its pericemen-

tum, and the anterior plate of the alveolus was gone down to a narrow strip at the gum margin. I informed the gentleman that the only thing that I could do was to amputate the denuded portion, but that I had never performed the operation and had never heard of its being done. The patient consented, however, so I split the gum over the tooth and examined the root, beginning at the apex and proceeding towards the neck of the tooth until sound tissue was reached. At that point I amputated the root with a fissure bur, and with a new finishing bur polished off the end of root that was left. then packed the opening with a litlle sterilized gauze and treated it about four times, after which the patient left the city. I performed a similar operation in May, 1891. In both cases the teeth are in position and doing good service to-day, as you can readily see from the models which I exhibit herewith and which show the present condition of the gums and teeth. When I performed the first operation there was nothing in dental literature describing such a procedure, so as far as I knew at the time it was entirely new.

Discussion. *Drs. J. P. Corley*, *H. H. Johnson*, and *W. E. Walker* had each performed this operation successfully in several instances and recommended it. *Dr. Johnson* had performed it in one case of a central incisor, afterwards crowning the root, and it was still doing good service. *Dr. Corley* asked *Dr. White* whether he would leave the root if a portion of it was denuded clear down to the gum. *Dr. White* replied that in his first case the distal surface of the root was denuded clear to the gum margin, but he cleaned out the pocket and treated it just as he would pyorrhea, and, as the model showed, the tooth was still in position.

Dr. H. E. Beach, Clarksville, Tenn.: In all straight-rooted teeth, when it becomes neeessary to amputate part of the root, the better plan would be to remove the tooth, cut off the diseased part, fill the canal, polish the end, and replace the tooth in its socket. This could be done more quickly, with less pain to the patient, and with more certainty as to result, than the operation described by Dr. White. Every preparation should be made beforehand so that each step should be done antiseptically, the root should be filled with some metallic material, and a retaining appliance should be worn for a few days to hold the tooth firmly in its place.

Minutes of the Fourth Annual Meeting of the Southern Branch of the

National Dental Association,

HELD AT

Nashville, Tenn., July 29–31, 1901.

FIRST DAY—MORNING SESSION.

THE fourth annual meeting of the Southern Branch of the National Dental Association was held in joint session with the Tennessee State Dental Association in the building of the University of Tennessee, Department of Dentistry, Nashville, Tenn., July 29–31, 1901.

The meeting was called to order at 10 a. m., with President Thos. P. Hinman in the chair.

The Rev. John Matthews of McKendree M. E. Church invoked the divine blessing upon the deliberations of the session.

Hon. Benton McMillan, Governor of Tennessee, delivered an address of welcome in the name of the state, and Hon. James M. Head, Mayor of Nashville, in behalf of the city extended a hearty and cordial greeting to the Associations.

Dr. W. M. Slack, President of the Tennessee State Dental Association, in a few graceful words expressed the satisfaction that the association over which he presided felt in joining its forces with those of the Southern Branch of the National Dental Association, and congratulated both bodies on the prospect of having a pleasant and profitable meeting.

Dr. V. E. Turner, Raleigh, N. C., Chairman of the Executive Committee, responded briefly to these addresses, giving voice to a feeling of gratification at the honor which had been bestowed upon

the society by the eloquent words which he felt would be a source of strength to the members in the work of the session.

The President, Dr. T. P. Hinman, then delivered his annual address, after which the association adjourned to meet at 2 p. m.

FIRST DAY—AFTERNOON SESSION.

The convention was called to order, the President in the chair.

Minutes of the previous meeting were read and approved.

The Committee on Pathology, Materia Medica and Therapeutics, being called upon for its report, Dr. D. R. Stubblefield made a verbal report, saying that he had been called upon at a very late day to act in the place of H. W. Morgan, Chairman of the Committee, and had written to all members of the Committee such letters as he thought would bring out work, but much to his disappointment he received only one hurried reply. He therefore wrote again, not only to the members of the Committee, but to a number of members of the Association outside of the Committee, but still with no better success.

He felt that the profession, especially perhaps in the southern states, was taking too little interest in the subjects which his Committee had in hand. The feeling seems to be that these subjects are merely theoretical, with no bearing on the practice of dentistry, and that the so-called practical subjects are much more important. This appears to him a mistake. The knowledge of these subjects is the basis of all successful practice, and without this knowledge no man can be prepared to fulfill his duty to his patients or uphold the honor of the profession. Moreover, if students and young practitioners are not grounded in these theoretical subjects they will probably always lack the full equipment for satisfactory practice which this knowledge alone can supply. He believed that dentists should be competent to treat their patients systemically when necessary with as much confidence as they would fill a tooth, and to do this a thorough knowledge of Materia Medica, Pathology and Therapeutics is essential. The young man should be compelled by those who train him to master these branches thoroughly. He hoped the discussion of the subject would put the Association on record in upholding the views he had expressed.

On motion, the report was accepted.

The Committee on Operative Dentistry, being called on for a report, and the chairman not being present, the following paper by Dr. H. H. Johnson was read, "Gold Filling, a Retrospect."

Discussed by Drs. Wm. Crenshaw, Frank Holland, W. V-B. Ames, R. K. Luckie, W. J. Morrison, W. P. Sims, A. G. Finney, W. E. Walker, J. Y. Crawford, Gordon White, and closed by essayist.

The following paper by Dr. L. G. Noel was read, "Management of the Permanent Superior Incisors and Cuspids."

Discussed by Drs. T. P. Hinman, H. E. Beach, J. Y. Crawford, J. P. Corley, H. W. Morgan, W. E. Walker, and closed by essayist.

On motion, Association adjourned to meet at 8 o'clock.

FIRST DAY—EVENING SESSION.

The meeting was called to order at 8 p. m. by the President.

Minutes of previous session were read and approved.

Report of Committee on Operative Dentistry was read by Dr. J. J. Sarrazin, Chairman.

Report of Committee on Operative Dentistry.

Your committee, through its chairman, respectfully submits that it has labored hard and continuously in an effort to obtain papers and report of cases for this meeting. About 225 postal cards and over 35 letters have been written, and a few members have been seen in person.

Owing to the fact that the chairman of the committee has for about six months of the year which has elapsed since the appointment of the committee been by ill health debarred from doing systematic reading and properly annotating and classifying it to form a basis for work, the present report is unfortunately defective in that respect.

Laying aside any citation of authorities, the committee dares to assert with unmingled happiness that the trend of dental operative

methods is more and more marked toward the basing of professional labor upon histologic and sound mechanic and prophylactic truths. Under the first mentioned heading the realization is becoming stronger each succeeding day that the direction and structure of enamel prisms do not permit their contact with underlying metal, and especially so on morsal surfaces and incisal edges. Observation is convincing operators, who may for years have attributed enamel margin cleavages under strain to accident, that the underlying cause is the lack of true application of histology to the preparation of cavity walls and margins, and that a sure remedy does exist in the support of enamel by dentin and the funnel beveling of the enamel itself. This in turn leads to making a greater use of the cohesive property, because the filling margin is rendered thinner in direct proportion to the amount of enamel bevel.

Under the mechanic basis is becoming recognized the fact that axial walls require the greatest amount of strength possible, and that the open space between them should just be equal at least to the width of the gingival floor of the cavity to permit perfect adaptation of nonplastic filling material. Mechanic considerations lead to shunning compound filling retention at proximo-incisal or morsal angles, which seldom indeed do not approach enamel, weakening dangerous portions, and to the substitution of the horizontal dovetail, lingual or morsal, thereby leaving axial walls of full strength and possessing safe outward funnel beveling of enamel. As the profession is becoming convinced that every excessive molecule of mercury in amalgam is a minute spring to produce the disruption of filling margins, it grows more and more partial to the use of matrices for amalgam full contours, and applies to them the preceding principles of cavity preparation. Amalgam that would neither shrink nor expand and would preserve a white color would become an ideal, especially in the bicuspids of decided brunets, where the contrast of the rich yellow gold color is so marked and apparent. Credit is due Dr. C. N. Johnson for a valuable classification in his book entitled, "Principles and Practice of Filling Teeth." This classification is not dwelt on in the text, but offers a guide to the accurate selection of color of material for operations exposed to view, from a pure gold color in the mouths of decided blondes to the gold and platinum combination, most nearly approaching the platinum shade, to harmonize with the features of a brunet. Mechanic con-

siderations also lead to the conversion into compound cavities of all proximal, buccal or lingual cavities which would not leave between the morsal margin of a metal filling and the incisal or occlusal surface of a tooth a sufficient thickness of dentin to preclude any danger of fracture under powerful masticatory forces.

The prophylaxis of cavity preparation and of shaping fillings is gaining recognition in compound cavities especially. It is of more limited application in simple cavities where it consists only of the greater or less beveling of sound enamel (according to locality), and of perfect filling margins, but it covers many considerations in compound cavity types. One of the features which doubtless merits more application than it obtains is the cutting away of cervical cavity margins in compound cavities slightly beyond the free margin of the gums to prevent stagnation of animal matter on such filling margins and the attendant consequences. Great interproximate space is an absolute requirement for the production of full bell-shaped contour. Interproximate gingival tissue is stretched and flattened while separation exists, and becomes convex and fuller at the base of the interproximate triangle, when the teeth reapproximate one another. A margin brought barely beyond the free edge of the gum, while large separation of the teeth exists, will therefore become entirely covered and protected by gingival tissue when marginal contact of the teeth returns. The cervical filling margin and its cervical angles are the most vulnerable portions of a contour, and and should therefore be given all the protection possible. Next in importance is probably the full approximal bell-shaping of filling contour and the production of a point of contact very near the morsal surfaces or incisal tooth edges. The prophylactic reasons therefore are too well known and too lengthy to rehearse in a report whose object is to condense underlying principles governing operative practise. Unhesitatingly we may say that success in the preceding direction depends upon the amount of interproximate space obtained. The cutting of proximal walls of a compound bicuspid or molar cavity slightly beyond the proximo-buccal or lingual axial line angles deserves special consideration. Thus bringing the filling margin beyond the interproximate space for friction of it by the tongue and cheeks is certainly most desirable, but the consideration of finished appearance will in some cases suggest abstention.

It is beyond the scope of the present report on condition of ope-

rative practice to review special methods of obturating cavities with different materials. The general method of compound cavity preparation herein considered leads to the use of cohesive material to form the bulk of the filling, while many prefer the lining of margins with non-cohesive gold or tin.

The use of inlays of gold or porcelain is certainly commendable under their proper indication. The mission of the gold inlay would apparently be to reach cases possessing walls too frail to permit gold foil condensation and to avoid unreasonably long protracted operations by the coherence of molecules of metal. The retention of the inlay, besides cement adhesion, would depend upon morsal dove-tail anchorage, and in many cases upon a pulp-canal flange in addition. It will minimize the use of cements and substitute instead a more lasting contour and morsal surface. Its margins, however, require watching and cannot be considered durable. The porcelain inlay is primarily indicated in simple cavities exposed to view. Its margins are in reality no more reliable than those of the gold inlay, but the fact that exposure to view also implies exposure to friction is a protection in a double sense, because it also includes ease of detection of any marginal defect.

J. J. SARRAZIN, *Chairman.*

On motion, adjourned to meet second day at 2 p. m., the forenoon of second day being devoted to clinics.

SECOND DAY—AFTERNOON SESSION.

The meeting was called to order by the President at 2:30 o'clock.

Minutes of the previous session were read and approved.

The Chairman of the Committee on Clinics presented the following report.

Report of Committee on Clinics.

1. Dr. Ames of Chicago, described the construction of gold inlays and showed the use of flux for retarding and controlling the setting of cements. He also showed his method of mixing cements.

2. Dr. Pope of Franklin, Tenn., exhibited a patient with a peculiar affection of the left temporo-maxillary articulation, render-

ing mastication painful and difficult, and at times making it very painful for the patient to open the mouth. This case was examined by Dr. Sumpter, who pronounced it a slight dislocation of the left condyle, the right being normal. The inability to open the mouth was due to spasmodic muscular contraction. As to contraction being due to the disease of the tooth, he thinks it questionable; would rather attribute it to pressure from dislocation.

3. Dr. Crossland of Montgomery, Ala., exhibited a digital splint for treating fracture of the hand; also a retaining appliance to be used after regulating the teeth; also a method of making solid gold dummies; also an original separating file.

4. Dr. W. K. Slater of Knoxville, Tenn., exhibited a new method of attaching porcelain teeth to rubber or celluloid plates; also a porcelain bridge so constructed upon platinum as to give great strength and take the strain off the porcelain at the inner cusps.

5. Dr. L. S. Gilbert of Denver exhibited the Griswold system of retaining springs for removable bridges and plate attachments.

6. Dr. Frank Holland of Atlanta made a contour gold filling, using cohesive gold condensed by the electro-magnetic mallet, the cavity being in the distal surface of a lower bicuspid.

7. Dr. A. G. Finney of Wilkesbarre, Pa., extracted a broken-down superior right first molar, palatine root abscessed, using the eureka non-secret extracting fluid; the patient experiencing no pain, and operation leaving no bad effects.

8. Dr. Vernon of Kansas City, Mo., demonstrated the working qualities of Vernon's non-crystal mat gold.

9. Dr. Crenshaw of Atlanta exhibited a new matrix for gold or plastic fillings; this instrument is applicable to proximate surfaces of any of the teeth.

10. Dr. Mewborn of Memphis exhibited models showing a method of constructing anchor plates or removable bridges for partial dentures.

11. Dr. Southall Dixon of Bolivar, Tenn., exhibited models showing a method of constructing a window crown so as to conserve all good enamel, restoring contour in gold. These crowns are especially applicable to front teeth.

12. Dr. J. E. Chace exhibited models showing his method of making a porcelain-faced crown with a detachable facing, using the ordinary crown and bridge tooth.

The Chairman of the Committee exhibited a working model showing a new matrix and clamp designed by Dr. L. P. Leonard o Chaska, Minn.

Dr. Gordon White exhibited models and amputated roots showing the results following his operations in root amputations. Some of these cases date back as far as October, 1886.

Discussion of Clinics.

Dr. W. V-B. Ames' Clinic: Dr. Ames said it was a peculiarity of dental cements that they lasted so much better under an inlay than they did when used as a filling. It is as surprising as the lasting qualities of gutta-perch in cavities between the six anterior teeth. Gutta-percha is a better material than cement in these cavities. In the use of the flux that he exhibited, it is better to add the flux to the liquid than to add it to the powder.

Dr. A. R. Polk's Clinic: Dr. Crawford said he had examined Dr. Polk's patient, and while there was a slight dislocation, he thought there was a variety of troubles and doubted whether the discomfort ought to be attributed to the dislocation or whether the dislocation was not attributable to the trouble that existed before the dislocation took place. He was inclined to think there was a retained third molar, which sometimes produces a difficulty in opening the mouth. Or the slight dislocation might have been caused by the premature loss of the teeth in the lower jaw. We know that under these circumstances the lower jaw inclines to become straightened, and the condyle does not move properly in the socket. This condition might possibly be cured by constructing a denture for the left side so that mastication would take place on both sides of the mouth. The muscles of the tongue in this patient showed nervous symptoms which might indicate something like paralysis. He thought the surgeon would be justified in making an incision at the glenoid fossa to see if there was an abnormal condition of the condyle.

Dr. Noel thought it might be a rheumatic condition of the muscles of the part. We know that rheumatism arises from a diseased condition of the blood, and all this trouble might yield to a continued exhibition of iodid of potash for the cure of the rheumatic condition.

Dr. Crawford thought salicylate of soda would be safer treatment than iodid of potash.

Dr. Holland thought the operation advised by Dr. Crawford, an incision at the glenoid fossa, might have serious effects on the articulation of the lower jaw.

Dr. Crossland's Clinic: Dr. Crawford spoke very highly of the splint shown by Dr. Crossland, and said that if he were so unfortunate as to have a broken hand he would wish to use just such a one.

Dr. Frank Holland's Clinic: Dr. Holland said that the satisfaction he got from giving such a clinic was not because he expected to teach the older practitioners anything new, but it was rather with the idea of bringing about the perfection of technique among the younger men that would result in much good in their work. If the large majority of the profession should adopt the proper means and make the proper effort the results that are gained by the best operators would be more common. He believed a thorough study of the electric mallet would give good results to the average dentist. The hard, tedious work with the hand mallet is too severe on the dentist. The electric mallet in competent hands will save labor to the operator and be a comfort to the patient. Good work can be done either by hand pressure, the hand mallet or the mechanical mallet, but human strength and endurance will not stand it.

Dr. Crenshaw's Clinic: Dr. Crenshaw said those who saw the matrix he exhibited understood its construction. The matrix, which is duplex in form, admits of contouring with gold and other materials, and can be removed from about the teeth without destroying the contour. Feeling the need in his own practice for a matrix which was reliable and easily adjusted, which would adapt closely at cervical margins, and which would not work loose under the pressure exerted upon it in filling, he had essayed to construct such a one. The matrix as it will be offered to the profession will be when in place entirely out of the operator's way, and will reflect light into the cavity or cavities. Its construction is such that the thin steel bands girt practically three-fourths around the teeth, and have a rigid tension upon them throughout their length.

Those who have read Dr. Clapp on combination fillings (in Kirk's Operative Dentistry) may have observed that he has devoted more time and space to the application of the matrix to a tooth than

he has to a description of the filling. This is because out of the list of matrices then at Dr. Clapp's disposal there was not one he could use to advantage, and he discards the regular stock matrices and substitutes a form which must be tied in place with silk cord or gilling twine. Those who have once tied on a matrix in this way for gold filling will not soon forget it.

On motion, the subject of clinics was passed and the Committee on Necrology was called on to report.

Report of Committee on Necrology.

SINCE the last official coming together of this Association Death has been busy at his appointed work. We present to you to-day a long list of those of our brothers who have paid the last debt and now rest from their labors. The roll-call of these departed brothers awakens a recollection all along the line of our profession's history.

Wm. Henry Morgan, M.D., D.D.S., died May 16, 1901. A charter member of this body and a pioneer in southern dentistry.

W. H. Burr, D.D.S., Madison, Ga., has died, also a charter member of this Association, who gave his life to Georgia dentistry.

W. W. H. Thackston, M.D., D.D.S., Farmville, Va., a charter member of this Association and another of the honorable representatives of our early days.

H. J. McKellops, M.D., D.D.S., of St. Louis, the very mention of whose name calls up a picture of flaming professional enthusiasm—another charter member.

W. H. Marshall, D.D.S., of Little Rock, Ark., one of the strong men of the ranks who carry the average of American dentistry to its exalted plane.

W. T. Arrington, D.D.S., of Memphis, also a charter member. One who was always ready to yield his full support to professional associations.

C. Sill, D.D.S., New York City. A type of those broadminded dentists who could not see the propriety of sectional subdivisions.

B. H. Catching, M.D., D.D.S., Atlanta. His face was always set to the rising sun of dentistry and his life was directed to its elevation.

And now, Mr. President and gentlemen, what has been said of these might properly be said of all. These men, almost to a man, were those standard-bearers of the profession that we love, who dared to hope for and claim for their life-work a standing of honor when the world, strange to say, scoffed at their presumption. They not only claimed such distinction for dentistry, but, better still, worked all their lives for its uplift. These and their associates were the fathers of dentistry and we of to-day who sit surrounded by the many manifestations of well assured standing and recognition, who are almost embarrassed by the riches of facilities and inventions ready to our hands, cannot yield too much homage to those who made our times possible.

Therefore, your Committee of Commemoration would suggest that even in the full tide of the progress of this meeting it would be proper and becoming that a halt be called and a short season of solemn reflection and memorialization be entered into. A few more such harvestings of our greatest and best will put all of the great progenitors of American dentistry into the company of the great in Heaven. They are passing away. Life has yielded to most of them the full fruition of their highest professional hopes, and we their heirs and survivors should yield our willing homage to their memories. Respectfully submitted,

H. E. Beach,
H. R. Jewett,
D. R. Stubblefield,
Committee.

Discussion on Necrology Committee's Report.

Dr. J. Y. CRAWFORD moved that the report be accepted, and that it be given a special memorial page in the record book of the Association, and that it be made part of the transactions of the National Dental Association. Continuing, Dr. Crawford said, that while he had never been a man-worshipper, he had always been inclined to admire and respect character in a man, and these men whom we were now called to memoralize were men of the highest and most exalted character. When a member of the Congress of the United States passes away a day is always devoted by that body to a memorial service, and it is fitting that the Southern Branch of the National Dental Association should now lay aside all

other business for a while to fittingly express our sense of bereavement at the loss of those honored fellow-members and professional associates.

Would it be sacreligious or improper to reverently invoke their presence, to ask them to be with us in spirit, and to aid and uphold us in our work in this our annual meeting? The last day of this meeting is near at hand, and we do not know who of those present are here for the last time. Let us stop then for a moment and drop a tear of reverent sorrow for the loss of these great men who have so recently departed.

I look upon the picture of Dr. H. J. McKellops, and I wish to say I am more indebted to him for any little advancement I may have made in dentistry than I am to any other one man, and I feel sure that there are many others in the room who are under the same obligation.

Dr. J. P. Gray, Nashville, said he knew Dr. W. W. H. Thackston slightly as an acquaintance, but was aware of the high esteem in which he was held throughout the profession, and has assisted to make him an honorary member of the National Association of Dental Faculties. Dr. W. H. Morgan he knew well and long, and honored him as a man of large heart and true and tenderest impulses. Dr. McKellops he had known for twenty-seven years, and he was always an inspiration to him. To meet him was always a pleasure. He always had a kind greeting for a friend, and being a man of strong convictions himself he loved strong convictions in others. Dr. McKellops had been like a father to him, always ready with good counsel, and more than good counsel he gave to him as he owed him substantial assistance when he was in trouble, and he will always love him for his good heart and noble, kind disposition.

Dr. S. W. Foster said we may well be profoundly impressed when we look upon the list of the names of fellow-members we have recently lost. As I think of Dr. Morgan in life I recognize one of strong convictions and unfaltering courage. In this connection I am reminded of a piece of unwritten history of the Southern Dental Association. Five men, Drs. Morgan, McKellops, Arrington, Edwards and Patrick (I believe) in 1868, recognizing the need, got together and discussed the necessity of an association to represent the dentists of this section, and the upshot of the discussion was that Dr. Morgan was instructed to write a joint letter which they

proposed sending to the more prominent dentists in the south. A copy was forwarded to Dr. McKellops, who was urged to sign and return it at once that they might go forward with the work to organize the association. Dr. McKellops replied that he had decided not to take the initiative, as he lived north of theMason and Dixon line, but he would be glad to do whatever was possible to make the movement successful. He then forwarded it to Dr. Arrington for his signature and after some weeks received an unfavorable reply. Dr. Morgan took the bit in his own mouth and sent the letters out. This movement resulted in the organization of this association. I have known all these men and have loved all of them. Especially do I revere the name of my old friend Dr. Morgan.

Dr. J. S. Vann, Gadsden, Ala., said it gave him great pleasure to arise and speak a few words about those great and good men who have passed away within the past few months. Some of them he did not know, and several he knew well, but of all those he loved especially his kind friend, Dr. W. H. Morgan. He never visited Nashville without a visit to his office. He had been there to-day and it filled his heart with grief to see so many things that brought his old friend so plainly back to his recollection. The old familiar room with the operating chair and cabinet, and the home itself where Dr. Morgan lived so many years. He was a very dear friend to him, always ready with help or counsel and his advice was always the best. So many times he told me to be thorough, that my success depended on my firmness. This was a cardinal article of his belief which he practiced as well as preached.

Dr. Gray said it seemed that there should be a history of the organization of the Association and a record of its work. He moved that the President appoint a committee to prepare such a history, so that while some of the earliest members were yet alive the facts which were in their possession should be put on record.

Dr. H. E. Beach said that some years ago he learned that Dr. W. W. H. Thackston wrote the first call for any dental organization on the face of the earth. He was glad that the early history of the Southern Dental Association was to be prepared and to be put on record.

Dr. W. E. Walker said that his mother had for some time been at work on the history of the Southern Dental Association, and had the original call sent out by Dr. Morgan at that time.

Dr. Gray altered his motion to read as follows:

Moved, that Dr. L. G. Noel and Dr. H. W. Morgan be appointed a committee to prepare a history of the Southern Dental Association,

The motion having received a second, Dr. Sarrazin moved as an amendment that Dr. Beach and Dr. Walker be added to the committee. The amendment was accepted and the motion passed.

Dr. J. T. Meadors then read a paper entitled, "Considerations of Conditions of the Interproximal Space."

Discussed by Drs. Gordon White, J. H. Crossland, R. K. Luckie, W. E. Walker, M. C. Marshall, W. V-B. Ames, the essayist closing.

Dr. J. P. Corley then read a paper entitled, "Inflammatory Phenomena Due to an Unerupted Third Molar."

Discussed by Drs. J. J. Sarrazin, A. R. Melendy, T. P. Hinman, S. W. Foster, J. E. Chace, W. E. Walker, H. E. Beach.

On motion, the subject was passed and the convention adjourned to meet at 10 o'clock on the morning of the third day.

THIRD DAY—MORNING SESSION.

The convention was called to order at 10 o'clock.

Minutes of previous meeting were read and approved.

Dr. C. L. Alexander, Charlotte, N. C., exhibited and described a system of cast fillings. The first case he showed was a badly broken-down molar. His method is to cut out the decayed dentin thoroughly, then fill the undercuts with gutta-percha and make a matrix of gold foil, as if for a porcelain inlay, fill this with gold solder and cement it in the tooth with gutta-percha.

Dr. H. H. Johnson, Macon, Ga., said various men claim to have originated this method of filling, and of their claims he would have nothing to say, but to Dr. Alexander we owe its presentation to the profession. He considers it a great advance over other filling methods. It is scientific work of the highest order, and it is the character of work that will elevate professional dentists above the dental parlor charlatan and mountebank. In these days of sharp competition we must be able to excel these people in their own field.

Modern crown and bridge work has been food to the dental parlor charlatans as bouillon is to the germ, and they have fattened and increased on it, but this kind of advance is beyond their power. The defects in such work cannot be hidden by being driven below the gum, but will be evident if such defects exist.

The Committee on Orthodontia and Oral Surgery being called, Dr. H. H. Johnson read a paper entitled, "Fracture of the Jaw. A Report of Two Cases."

On motion, the election of officers was made a special order of business for 3:30 o'clock in the afternoon.

On motion, the Association adjourned to meet at 2:30 p. m.

THIRD DAY—AFTERNOON SESSION.

The convention was called to order at 2:30 o'clock.

Minutes of the previous meeting were read and approved.

The following report of the Committee on Oral Hygiene was read by Dr. J. P. Corley, Chairman:

Report of Committee on Oral Hygiene.

MR. PRESIDENT AND GENTLEMEN OF THE SOUTHERN BRANCH OF THE NATIONAL DENTAL ASSOCIATION:—It is a matter of regret and chagrin on my part that, although I have been given two committees on hygiene, the only thing I have to submit is a short paper from my own hand, hastily scribbled while convalescing from a recent illness. Aside from my committeemen, I have addressed some able writers requesting contributions, but notwithstanding the unprecedented activity in association circles along this line, there seems to be great hesitancy on the part of the individual dentist in contributing to the cause.

The action of the National Association in appointing a committee to champion the cause was most wise and commendable. The work accomplished by this committee, while it is in its incipiency, is sufficient to attest the wisdom and enthusiasm of its members.

It is unfortunate that a working basis could not have been established earlier in the scholastic year, but the way has been opened for a thorough canvass of the schools of the entire country during the coming winter. The man who denies this committee his sympathy and support, be it through ignorance or indifference, is criminal.

The number of society, journal and popular papers on the subject is notably on the increase. It is evident to every thinking man that individual and associated effort was never at so great a premium, nor did it ever offer so great a reward.

J. P. Corley, *Chairman.*

Discussion: Dr. W. E. Walker said he had taken an active part in the work of this committee in the National Dental Association, and he thanked Dr. Corley for the work he had done in the same line. The subject of oral hygiene in the public schools was receiving attention from quite a number of state societies. The committee of the National Dental Association had sent blanks out to the state societies appropriate for those to use who were making examinations of the school children's mouths. Not very many such examinations had been made as yet, but they hoped next winter to have the material for a full report as to the number of cases of caries, of irregularities, and the proportion of children who habitually used tooth-brushes.

On motion, the report was accepted.

The following paper by Dr. J. P. Corley was read—"Oral Hygiene."

Discussed by Dr. H. W. Morgan and closed by essayist.

On motion, the subject was passed and the Committee on Prosthetic Dentistry was called.

Dr. J. Y. Crawford, chairman, reported that he had one paper to present, entitled, "Crown Work," by H. H. Johnson, D.D.S., Macon, Ga.

Dr. Gordon White, Nashville, read a paper entitled "Amputation of the Roots of Teeth to Cure Abscess." Discussed by Drs. J. P. Corley, H. H. Johnson, W. E. Walker, H. E. Beach.

The Committee appointed to consider and report on the President's Address presented the following report:

Report of Committee on President's Address.

MR. PRESIDENT: We suggest that formal request be made to the National Association that it set aside some portion of the first day of its meeting for a business meeting of the Southern Branch, where dues can be paid and delegates received, whenever the National meets in the Southern section.

We heartily endorse the action of the President and Executive Committee in calling this meeting at time and place, and believe it conserves the best interest of both the Southern Branch and the National.

We endorse the recommendation of the President, that it may be the duty of the Corresponding Secretary of this Association to annually notify the Corresponding Secretaries of the different state associations in the south of their privilege of electing delegates to this Association.

We suggest the appointment of a committee of three to consider the reconstruction of Section 1, Article 8, which refers to the standing committee, and on motion substitute that committee report at next annual meeting.

In regard to nostrums, your committee would suggest that this Association through its Corresponding Secretary request the different reputable dental journals to eliminate nostrums from their advertising lists.

The suggestion that a medal be offered for original scientific research is a step in the right direction; we believe that the principle is correct, but in the present state of organization it is hardly practicable.

Your Committee approves of the President's suggestion to create an office in this Association to be known as that of Essayist; the Essayist to be elected at the annual meeting of this Association and serve the term of one year, or until his successor is elected. His duty shall be to prepare an essay to be read before this Association at its annual meeting following his election, subject to be chosen by the writer.

We most emphatically endorse the suggestion of the President in regard to holding one special line of clinics in addition to the general clinics, in order that scientific questions may be settled by a concensus of opinion upon this particular line. It should also be made the imperative duty of every clinician, both special and general, to submit a written report to the Chairman of Clinics of his particular operation.

Your committee would recommend that this Association pass a resolution requesting the National Association to allow the Southern Branch to retain three-fifths of the annual dues, instead of two-fifths as heretofore.

In reference to the President's allusion to the services rendered by Dr. Wms. Donnally to the profession in promoting passage of the bill in Congress employing dental surgeons in the army, we suggest that a special resolution be passed expressing our thanks to Dr. Donnally and his efficient committee for this incalculable service to the profession, and that the Recording Secretary convey to Dr. Donnally this expression of gratitude. We further recommend that earnest efforts be made to secure a similar corps, or what would be better, a commissioned corps for the navy.

Respectfully submitted,

R. K. Luckie, *Chairman.*
V. E. Turner,
J. P. Corley.

On motion, report was adopted and committees were appointed as follows:

Committee appointed to request the National Dental Association to allow the Southern Branch to retain three-fifths of the annual dues: Dr. L. G. Noel, Chairman, Dr. W. E. Walker, Dr. Wm. Crenshaw.

Committee to consider the reconstruction of Section 1, Article 8, of Constitution and By-Laws: Dr. H. H. Johnson, Chairman, Dr. J. J. Sarrazin, Dr. H. R. Jewett.

Committee on Life Insurance: Dr. J. Y. Crawford, Chairman, Dr. C. A. Merrill, Dr. C. L. Alexander.

The Committee on New Appliances presented the following report:

Coffin spring principle on a silver base. Swage base of silver plate, trim and fit to case. Attach 18k spring wire to base. Cut base through median line to heel, or from back to front, leaving a slight strip in cut if so desired, or cut base in sections to suit the individual case. Advantages over vulcanite base are numerous and important and will suggest themselves. Carve cusp in modeling composition; take impression in plaster; fill impression with mouldine; press firmly on metal slab; lift plaster impression off; place rubber ring over mouldine cusp duplicate and run fusible die. This gives a female die such as you get with the Hollingsworth system. Advantage suggestive. J. P. CORLEY.

On motion, the report was accepted.

The hour of 3:30 having arrived, the election of officers was taken up, and resulted in the selection of—

President, Dr. H. H. Johnson, Macon, Ga.

First Vice-President, Dr. L. G. Noel, Nashville, Tenn.

Second Vice-President, Dr. Geo. S. Vann, Gadsden, Ala.

Third Vice-President, Dr. W. G. Mason, Tampa, Fla.

Secretary, S. W. Foster, Atlanta, Ga.

Treasurer, B. D. Brabson, Knoxville, Tenn.

Executive Committee:—Dr. V. E. Turner, Raleigh. N. C.; Dr. W. K. Slater, Knoxville, Tenn.; Dr. E. G. Quattlebaum, Columbia, S. C.; Dr. I. Simpson, Rock Hill, S. C.; Dr. A. R. Melendy Knoxville, Tenn.; Dr. J. G. Fife, Dallas, Texas.

Place for next meeting, Atlanta, Ga.

Time, week of February 22, 1902.

On motion, adjourned.

S. W. FOSTER, *Recording Secretary*.

Members of the Southern Branch of National Dental Association.

who have paid dues for 1901, also names of charter members of the old Southern Dental Association, who are exempt from dues but are to receive the transactions, and will be marked thus.*

Alexander, C. L. ..... Charlotte, N. C.
*Arrington, B. F. ..... Goldsboro, N. C.
*Augspath, L. ..... Little Rock, Ark.
Beach, H. E. ..... Clarksville, Tenn.
Beach, John R. ..... Clarksville, Tenn.
Benton, J. H. ..... New Berne, N. C.
Billmeyer, U. D. ..... Chattanooga, Tenn.
Boozer, J. E. ..... Columbia, S. C.
*Boyd, H. D. ..... Troy, Ala.
Brabson, B. D. ..... Knoxville, Tenn.
Brochet, C. T. ..... Atlanta, Ga.
*Brown, J. P. H. ..... Augusta, Ga.
Bogle, R. Boyd ..... Nashville, Tenn.
Cassidy, J. S. ..... Covington, Ky.
*Carpenter, L. D. ..... Atlanta, Ga.
Chapple, J. A. ..... Atlanta, Ga.
Clifton, W. R. ..... Waco, Texas.
Cockerille, S. J. ..... Washington, D. C.
*Cole, W. T. ..... Newman, Ga.
*Cook, W. H. ..... Denton, Texas.
Corley, J. P. ..... Greensboro, Ala.
Crawford, J. Y. ..... Nashville, Tenn.
Crenshaw, Wm. ..... Atlanta, Ga.
Combs, J. W. ..... New Braunfels, Texas.
Chace, J. E. ..... Ocala, Fla.
Crutcher, R. D. ..... Lewisburg, Tenn.
Crossland, J. H. ..... Montgomery, Ala.
Dale, J. A. ..... Nashville, Tenn.
David, J. W. ..... Corsicana, Texas.
Dixon, Southall. ..... Bolivar, Tenn.
Dotterer, L. P. ..... Charleston, S. C.
Eubank, Geo. ..... Birmingham, Ala.

Everitt, D. E. ..... Raleigh, N. C.
Fife, J. G. ..... Dallas, Texas.
Finney, W. B. ..... Baltimore, Md.
Foster, S. W. ..... Atlanta, Ga.
*Friedrichs, G. J. ..... New Orleans.
Frink, C. H. ..... Fernandina, Fla.
*Gorgas, F. J. S. ..... Baltimore, Md.
Gray, J. P. ..... Nashville, Tenn.
Gunn, C. L. ..... Gadsden, Ala.
Hall, J. A. ..... Collinsville, Ala.
Hardy, Geo. E. ..... Baltimore, Md.
Harris, Jas. H. ..... Baltimore, Md.
Hinman, T. P. ..... Atlanta, Ga.
*Holland, Sid G. ..... Atlanta, Ga.
Holland, Frank ..... Atlanta, Ga.
Hassell, H. Clay ..... Tuscaloosa, Ala.
Jewett, H. R. ..... Atlanta, Ga.
Johnson, H. H. ..... Macon, Ga.
Jones, Hy. C. ..... Richmond, Va.
Keerans, E. P. ..... Charlotte, N. C.
Kettig, E. M. ..... Louisville, Ky.
*Knapp, Jos. S. ..... New Orleans.
Knapp, J. Rollo ..... New Orleans.
Le Sueur, W. N. ..... Austin, Texas.
*Lowrance, H. A. ..... Athens, Ga.
Luckie, R. K. ..... Holly Springs, Miss.
*Marshall, E. B. ..... Rome, Ga.
Mason, W. G. ..... Tampa, Fla.
Martin, W. T. ..... Yazoo City, Miss.
Melendy, A. R. ..... Knoxville, Tenn.
Merchant, M. S. ..... Giddings, Texas.
Morgan, H. W. ..... Nashville, Tenn.
*McDonald, R. A. ..... Griffin, Ga.
McDonald, J. P. ..... Shelbyville, Tenn.
Meadors, J. T. ..... Columbia, Tenn.
Merrill, C. A. ..... Birmingham, Ala.
Noel, L. G. ..... Nashville, Tenn.
Parr, H. A. ..... New York City.
Pressey, J. B. ..... Hampton, Va.
*Rambo, Samuel ..... Montgomery, Ala.
Rutledge, B. ..... Florence, S. C.
Rich, Celia ..... Nashville, Tenn.
Slater, W. K. ..... Knoxville, Tenn.
Sarrazin, J. J. ..... New Orleans.
Smith, B. H. ..... Baltimore, Md.
Stiff, F. W. ..... Richmond, Va.

Slack, W. M.....Memphis, Tenn.
Sims, W. P.....Nashville, Tenn.
*Tigner, J. A.....Rome, Ga.
Turner, V. E.....Raleigh, N. C.
Vann, Geo. S.....Gadsden, Ala.
Wyatt, T. M.....Bentonville, Ark.
Walker, W. E.....New Orleans, La.
Walker, J. L.....Norfolk, Va.
Walker, R. H.....Norfolk, Va.
Whitby, T. P.....Selma, Ala.
Wilson, F. C.....Savannah, Ga.
Wise, J. D.....West Point, Miss.
Wood, F. L.....Roanoke, Va.

LIST OF OFFICERS.

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